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GCSE MATHS

Algebra

Edexcel 1MA1 | Subtopic collection Topic 11

Algebraic notation, substitution and identities

Foundation tier

Answers and examiner comments

150	2011-2025	Foundation
question groups	available papers	tier

Using this booklet

1. Answer numbers match the companion question booklet.
2. Follow the original question number on marking tables.
3. Examiner comments are included where available.

Name _____ **Date** _____

Some entries use full source marking material in an appendix. Any unavailable mark schemes are identified beside the relevant answer.

Question	Working	Answer	Mark	Notes
13		0.06 or 6%	2	M1 for 1 - (0.09 + 0.18 + 0.16 + 0.21 + 0.30) oe OR M1 for 100 – (9 + 18 + 16 + 21 + 30) oe OR M1 for $1 - (\frac{9}{100} + \frac{18}{100} + \frac{16}{100} + \frac{21}{100} + \frac{30}{100})$ A1 for 0.06 or 6% (6 only gets A0) or $\frac{6}{100}$ oe [SC; B1 for 6 on the answer line without working, if M0 scored]

5	(i) (ii)		130 Reason	2	B1 for 130 cao B1 for reason eg "angles on a (straight) line (sum to) 180° NB: those underlined are the essential elements of an answer.

5MB2F_01

Question	Working	Answer	Mark	Notes
6 (a)		$3c$	1	B1 cao
(b)		$2x + 6y$	2	B2 for $2x + 6y$ (B1 for $2x$ or $6y$)

13	(a)	$1-0.3-0.1-x$	$0.6-x$	2	M1 for $0.3+0.1+x+P(2)=1$ oe A1 $0.6-x$ or $\frac{6}{10}-x$ or $1-(0.4+x)$ Or $1-0.3-0.1-x$
	(b)		$300x$	1	B1 for $300x, x\times 300$ oe

4	(a)		$4d$	1	B1 accept $4 \times d, d \times 4, d4$
	(b)		$f + 10$	2	M1 for f or $1f$ or 10 or for $3f$ $2f$ and $4 + 6$ A1 for $f + 10$ (accept $1f + 10$)

16		$(x + x + 3 + 2x) \div 3$ $= (4x + 3) \div 3$	$\frac{x + x + 3 + 2x}{3}$ oe	2	M1 $x + x + 3 + 2x$ $(=4x+3)$ oe or $4x + 3 \div 3$ oe A1 $\frac{x + x + 3 + 2x}{3}$ oe

12			$4x + 9y$	2	B2for $4x + 9y$ (B1for $4x$ or $9y$ seen)

5MB2F_01

Original question 14

The full source mark scheme begins on page 202. Use the original paper code, tier and question number shown above.

Question		Working	Answer	Mark	Notes
15	(a)	Missing sides are $2x + 1$ and $3x + 3$ Perimeter = $5x + 1 + x + 3x + 2x + 3 + 2x + 1 + 3x + 3$ OR $2(5x + 1) + 2(2x + 3 + x)$	$16x + 8$	3	M1 for $5x + 1 - 3x$ or $2x + 3 + x$ or identifying a missing side as $2x + 1$ or $3x + 3$(maybe on the diagram) M1 for adding 5 or 6 sides from x, $5x + 1$, $3x$, $2x + 3$, '$2x + 1$', '$3x + 3$' where the missing sides are in the form $ax \pm b$ (a and $b \neq 0$) or $2(5x + 1) + 2(2x + 3 + x)$ oe A1 for $16x + 8$ oe for unsimplified expression
	(b)		$4x + 2$	1	B1 ft for ['$2(5x + 1) + 2(2x + 3 + x)$'] ÷ 4 or ("$16x + 8$") ÷ 4 oe where the answer is an algebraic expression in x

5MB2F_01

Question		Working	Answer	Mark	Notes
5	(a)		$5g$	1	B1 or $g5$
	(b)		$4m$	1	B1 or $m4$
	(c)		$20ef$	1	B1 or equivalent simplified form

15	(a)		4	1	B1 cao
	(b)	9.5 – 4.75 = **OR** 9.5 ÷ 2 =	4.75	2	M1 for 9.5 – 4.75 **or** 9.5 ÷ 2 **or** 4.75 – 9.5 A1 cao
	(c)		6	1	B1 cao
	(d)	12 × 4 =	48	2	M1 for × 4 seen **or** identifying + 0.5 for every 2 inches **or** 12 + 12 + 12 + 12 oe **or** build up method eg 12, 24, 36, 48 allow one error A1 cao

Question		Working	Answer	Mark	Notes
26	(a)	$2 \times 5 \times 2 = 20$ $300 \div 20 =$	15	3	M2 for $300 \div (2 \times 5 \times 2)$ oe (M1 for $2 \times 5 \times 2$ **or** 20 seen **or** $300 \div (2 \times 5)$ **or** 30 seen A1 cao
	(b)	$c = \frac{30 \times 40}{150}$ =	8	2	M1 for $\frac{30 \times 40}{150}$ **or** 1200 seen A1 cao

Question		Working	Answer	Mark	Notes
6	(a)		$3c$	1	B1 $3c$ oe
	(b)		$6ef$	1	B1 $6ef$ oe
	(c)		$7p + 5t$	2	B2 for $7p + 5t$ (B1 for either $7p$ or $5t$)

14	(a)	$3.5 \times 12 - 5$	37	2	M1 for $3.5 \times 12 - 5$ or 42 - 5 A1 cao
	(b)	$3.5 \times -9 - -6$	–25.5	2	M1 for $3.5 \times -9 - -6$ **or** $3.5 \times -9 + 6$ **or** sight of –31.5 A1 for –25.5 **or** $-\frac{51}{2}$ **or** $-25\frac{1}{2}$

1MA0_2F

10	(a)		$b - a$	1	B1 cao
	(b)		$\frac{(a + b)}{2}$	1	B1 for $\frac{(a+b)}{2}$ oe

5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
***11**		2×39.50 + 3×23.75 = 150.25 2×40.25 + 3×21.85 = 146.05	Seawagon	4	M1 for 2×39.50 + 3×23.75 or 150.25 or 2×40.25 + 3×21.85 or 146.05 or 2*a* + 3*b*, where *a* and *b* are consistent values from table or sight of 39.50 and 23.75 or 40.25 and 21.85 M1 for 2×39.50 + 3×23.75 and 2×40.25 + 3×21.85 A1 for (£)150.25 and (£)146.05 C1 (dep on M1) for Seawagon or ft from their answers and condone stating an incorrect difference

3	(a)		$5p$	1	B1 for $5p$
	(b)		$4rs$	1	B1 for $4rs$
	(c)		$7a + 2b$	2	M1 for $7a$ or $2b$ accept equivalents; ignore signs A1 for $7a + 2b$

5MB2F_01

Question		Working	Answer	Mark	Notes
12	(a)	24 ÷ 4 + 5	11	2	M1 for 24 ÷ 4 + 5 or 6 + 5 A1 cao
	(b)	13 = ? ÷ 4 + 5 ? = (13 – 5) × 4	32	3	M2 for (13 – 5) × 4 (M1 for 13 – 5 × 4 or 13 = ? ÷ 4 + 5 or 13 – 5 or × 4 seen as second operation) A1 cao SC B1 for 47 as answer NB accept reverse flowcharts for inverse operations

5MB3F_01

13	(a)		$3f$	1	B1 for $3f$ or $f3$ or $3 \times f$ or $f \times 3$
	(b)		$6m$	1	B1 for $6m$ or $m6$
	(c)		$4a + 5h$	2	B2 for $4a + 5h$ or $5h + 4a$ (B1 for $4a$ or $5h$ or $4a + 5h = 9ah$)

Original question 19

The full source mark scheme begins on page 216. Use the original paper code, tier and question number shown above.

4	(a)		32 and 10	2	B1 for 32 in the correct place B1 for 10 in the correct place
	(b)	10×3×2=60 or 10 ×3 +30 = 60	×2 or +30	1	B1 for ×2 or +30

Question		Working	Answer	Mark	Notes
10	(a)	30 + 8×4	62	2	M1 for 30 + 8×4 or attempt to add four 8s to 30 (allow one error in addition) A1 cao
	(b)	110 – 30 = 80 80÷8 = 10 **OR** 110 – 62 = 48 48÷8 = 6 4 + 6 = 10	10	3	M1 for 110 – 30 (=80) M1 (dep) for '80' ÷ 8 or A1 cao OR M1 for 110 – 62 (= 48) M1(dep) for '48'÷8 = 6 A1 cao

Question		Working	Answer	Mark	Notes
18	(a)	$y = 4 \times 7.5 + 5.4$	35.4	2	M1 for $4 \times 7.5 + 5.4$ A1 cao
	(b)	$18.8 = 4x - 2.4$ $x = \frac{18.8 + 2.4}{4}$	5.3	2	M1 for intention to add 2.4 to 18.8 or to subtract -2.4 from 18.8 or to divide 18.8 and (-)2.4 by 4 A1 cao

9	(a)		$3t$	1	B1 for $3t$ or $t3$
	(b)		$6w$	1	B1 for $6w$ or $w6$
	(c)		$2mn$	1	B1 for $2mn$ or $2nm$ or $nm2$ or $mn2$ or $n2m$ or $m2n$

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
10*		6 small packs, 6 × 7 = 42 2 medium packs, 2 × 18 = 36 1 large and 2 small packs, 25 + 2 × 7 = 39 1 medium and 3 small packs, 18 + 3 × 7 = 39 **OR** cost per envelope Medium 1800 750 = 2.4p 2.4p x 1500 = 36 Cost per envelope Small 700 250 = 2.8p 2.8 x 1500 = 42	Two medium + supportive evidence	5	M2 work out at least two possible combinations for 1500 envelopes (M1 for an attempt to work out one possible combination of envelopes) A1 for one correct costing for 1500 envelopes. A1 for 3 or 4 correct costings for 1500 envelopes including £36 C1 Dep M2 for conclusion and clear evidence from their costs **OR** M2 work out the cost of the same number of envelopes (eg 1 or 250) in at least two pack sizes. (must see at least 2 calculations) (M1 for attempt to work out the cost of a fixed number of envelopes (eg 1 or 250) in 1 pack size (must see a calculation)) A1 for one correct costing for their quantity resulting from their calculations. A1 for all 3 correct costings C1 Dep M2 for conclusion and clear evidence from their costs

5MB2F_01

12	(a)	$5 \times 4 - 2 \times 3$	14	2	M1 for $5 \times 4 - 2 \times 3$ oe A1 cao
	(b)	-5×-5	25	1	B1 cao

9	(a)	25 × 9 + 10	235	2	M1 25 × 9 + 10 A1 cao
	(b)	360 – 10 = 350 350 ÷ 25	14	3	M1 360 – 10 (=350) or 360 ÷ 25 (=14.4) M1 for correct order of operations – 10 then ÷ 25 A1 cao OR M1 reverse flowchart for inverse operations with either – 10 or ÷ 25 M1 reverse flowchart for inverse operations with both – 10 and ÷ 25 in correct order A1 cao OR M1 14 × 25 M1 350 + 10 or 14 × 25 + 10 A1 cao

5MB3F_01

Question		Working	Answer	Mark	Notes
18		$x + x + 4 + x - 2 = 26$ $3x + 2 = 26$ $3x = 24$ $x = 8$ OR $26 - 4 = 22$ $22 + 2 = 24$ $24 \div 3$	8	4	M1 $x + x + 4$ or $x + x - 2$ or $x + 4 + x - 2$ or "expression in x" + $x + 4 = 26$ or "expression in x" + $x - 2 = 26$ M1(dep) "3"x + "2" = 26 M1 "3"x = 26 - "2" A1 cao OR M1 $26 - 4$ or $26 + 2$ M1 "22" + 2 or "28" - 4 M1 "24" ÷ 3 A1 cao OR M3 6 + 8 + 12 seen (M2 three ages that meet the criteria x, $x + 4$ and $x - 2$) (M1 two trials of three ages added or a set of three ages that would add to 26) A1 cao

9	(a)		$4a$	1	B1 for $4a$ oe as a single term
	(b)		$3cd$	1	B1 for $3cd$ oe as a single term
	(c)		$7ef$	1	B1 for $7ef$ oe as a single term
	(d)		3	1	B1 cao
	(e)		2	2	M1 for intention to subtract 7 from each side or divide each term by 5 or embedded method A1 cao

1MA0_1F

Question		Working	Answer	Mark	Notes
14		$2x$ $x+3$ $x+2x+x+3$	$x+2x+x+3$	2	M1 $2x$ or $x+3$ A1 $x+2x+x+3$ oe
*15			Yes	6	B1 283 or 285 M1 for working out the total cost of 2 adults one way or 1 adult both ways M1 for a correct method for calculating a child fare as 75% of an adult fare for one or both journeys M1 for working out the total cost for 2 adults and 1 child A1 for 1562 or 38 C1 dep on a previous M1 for correct conclusion ft for their total cost (identified) provided it is written with a £ sign.

5MB1F_01

12	(a)		$5y$	1	B1 cao
	(b)		$10k$	1	B1 cao

12	(a)		9	1	B1 cao
	(b)		12	1	B1 cao
	(c)		4	1	B1 cao
	(d)		22	2	M1 for 2×5 (= 10) and 3×4 (= 12) A1 cao

Original question 18

The full source mark scheme begins on page 234. Use the original paper code, tier and question number shown above.

15	(a)		6	1	B1 cao
	(b)		21	1	B1 cao
	(c)		5	1	B1 cao

4	(a)		$5m$	1	B1 for $5m$ or $5\times m$ or $m\times 5$ or $m5$
	(b)		$9p$	1	B1 for $9p$ or $p9$
	(c)		$4tw$	1	B1 for $4tw$ or $4wt$ or $tw4$ or $wt4$ (condone $4\times tw$ and $4\times wt$)

PAPER: 1MA0_2F

8	(a)	4×3	12	1	B1 cao
	(b)		5	2	M1 for $4 \times 2 - 3$ A1 cao

Original question 14

The full source mark scheme begins on page 254. Use the original paper code, tier and question number shown above.

10	(a)		$4d$	1	B1 oe
	(b)		$4x + 12y$	2	B2 for $4x + 12y$ oe (B1 for $4x$ oe or $12y$ oe seen as part of an expression in terms of x and/or y

PAPER: 5MB1F_01

5	(a)		$4y$	1	B1 cao
	(b)		$5cd$	1	B1 cao
	(c)		$5a + 3b$	2	M1 for partial simplification $5a$ **or** $+3b$ A1 cao

PAPER: 5MB2F_01

11	(a)		$4b$	1	B1 for $4b$ oe
	(b)		$5n$	1	B1 for $5n$ cao
	(c)		$3cd$	1	B1 for $3cd$ oe algebraic simplified form
	(d)		$5x+6y$	2	M1 $5x$ or $6y$ A1 cao

PAPER: 1MA0_1F

10		(12)	10	1	B1 cao
		80	(27)	1	B1 cao

20	(i)		$x + 4$	1	B1 for $x + 4$ oe
	(ii)		$2x$	1	B1 for $2x$ oe

Original question 8

The full source mark scheme begins on page 274. Use the original paper code, tier and question number shown above.

Original question 12

The full source mark scheme begins on page 274. Use the original paper code, tier and question number shown above.

5	(a)		$3p$	1	B1 for $3p$
	(b)		$8t$	1	B1 for $8t$

PAPER: 5MB2F_01					
Question		Working	Answer	Mark	Notes
*6			No with working and (£)1.76 or (£)8.19	4	M1 for method to find the total of the two items eg 3.25 + 2.99 (= 6.24) M1 for complete method eg subtract the cost of two items from 8 or add on the cost of a coffee to the two items A1 for (£)1.76 or (£)8.19 C1 (dep on M1) ft for statement shown with correct money notation. OR M1 for subtraction of the cost of an item from 4 or 8 M1 for complete method eg adding the two remainders or subtracting the second value from their running total A1 for (£)1.76 C1 (dep on M1) ft for statement shown with correct money notation.

12	(a)		$3ac$	1	B1 cao
	(b)		p^3	1	B1 cao
	(c)		$8x - 7y$	2	M1 for $8x$ or $\pm 7y$ A1 cao

PAPER: 1MA0_1F

PAPER: 1MA0_1F

Question		Working	Answer	Mark	Notes
18	(a)		–7	2	M1 for 3 × –5 (= –15) **and** 4 × 2 (=8) A1 cao
	(b)(i)		10*p*	2	B1 for 10*p* oe
	(b)(ii)		10*p* – 7		B1ft for "10*p*" – 7 Note "10*p*" MUST be an algebraic expression

23	(a)		92.3521	1	B1 cao
	(b)		p^6	1	B1 cao
	(c)		t^5	1	B1 cao
	(d)		6	1	B1 cao
*24			Tuesday and Friday	3	M1 for 179 ÷ 12 or 162 ÷ 12 or 170 ÷ 12 or 143 ÷ 12 A1 for 14.9(166…) or 15 and 13.5 or 14 and 14.1(66…) or 15 and 11.9(16…) or 12 C1 (dep M1) ft for comparison of their results for all the days with the number of teachers available leading to a correct statement **Or** M1 for 179 ÷ 15 or 162 ÷ 13 or 170 ÷ 14 or 143 ÷ 12 A1 for 11.9(3…) or 12 and 12.4(6…) or 13 and 12.1(4…) or 13 and 11.9(1…) or 12 C1 (dep M1) ft for comparison of their results for all the days with 12 leading to a correct statement **Or** M1 for 15 × 12 or 13 × 12 or 14 × 12 or 12 × 12 A1 for 180 and 156 and 168 and 144 C1 (dep M1) ft for comparison of their results for all the days with the number of students taking part leading to a correct statement

PAPER: 1MA0_2F

15			$\frac{20-x}{20}$	2	M1 for writing $20-x$ OR 20 as any denominator below an algebraic expression in x or $20-x \div 20$ A1 for $\frac{20-x}{20}$ or $1-\frac{x}{20}$ oe

10	(a)		$3a$	1	B1
	(b)		$12y$	1	B1
	(c)		$5e + 3f$	2	M1 (implied) for $5e$ or $3f$ A1 oe

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12	(a)		x^6	1	B1 cao
	(b)		y^2	1	B1 cao

12			14	2	M1 for $4 + 2 \times 5$ A1 cao

22	(a)		$5x - 3 = 52$	3	M1 for $2x$ or $2x - 3$ seen M1 for x and $2x$ and $2x - 3$ A1 for $5x - 3 = 52$ from correct working
	(b)		11	2	M1 for intention to either add 3 to both sides or divide all terms by 5 as a first step A1 cao

Original question 14

The full source mark scheme begins on page 286. Use the original paper code, tier and question number shown above.

9	(a)		$4d$	1	B1 cao
	(b)		$3ef$	1	B1 cao
	(c)		$5x + 2y$	2	M1 for $5x$ or $2y$ A1 cao

PAPER: 5MB2F_01

Original question 6

The full source mark scheme begins on page 299. Use the original paper code, tier and question number shown above.

Original question 7

The full source mark scheme begins on page 299. Use the original paper code, tier and question number shown above.

6	(a)		11	1	B1 cao
	(b)		+ 8 or × 3	1	B1 for + 8 or × 3

5	(a)		$5e$	1	B1 cao
	(b)		$7gh$	1	B1 cao
	(c)		$a + 6d$	2	M1 for a or $6d$ A1 cao

PAPER: 1MA0_2F

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
17			$T = 6d + 15f$	3	M1 for $6d$ or $15f$ or T = a linear expression in d and/or f M1 for $6d + 15f$ oe or $T = 6d$ (+ kf) oe or $T = 15f$ (+ kd) A1 $T = 6d + 15f$ oe

13	(a)		$1 - x$	1	B1 cao
	(b)		$200(1 - x)$	2	M1 for $200 \times$ "$(1 - x)$" A1 ft e.g. $200(1 - x)$ or $200 - 200x$

10	(a)		$3t$	1	B1 for $3\times t$ or $3t$
	(b)		$5ef$	1	B1 cao
	(c)		$4x + 6y$	2	M1 for $4x$ or $6y$ A1 cao

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Question		Working	Answer	Mark	Notes
12	(a)		410	2	M1 for 4 × 90 + 50 (=410) A1 cao
	(b)		9	3	M1 for one inverse operation eg −50 or ÷90 M1 for complete inverse operations, eg (860 – 50) ÷ 90 accept 860 – 50 ÷ 90 A1 cao **OR** M1 ft for finding the difference to part (a), ie 860 – "410" (=450) M1 for "450" ÷ 90 A1 cao

4	(a)		$\frac{32}{9}$	2	B1 cao B1 cao
	(b)		$+7$ or $\times\frac{10}{3}$	1	B1 for $+7$ or $\times\frac{10}{3}$

15			19	2	M1 for $2 \times 6.5 + 3 \times 2$ **or** 13 and 6 A1 cao

Original question 12

The full source mark scheme begins on page 315. Use the original paper code, tier and question number shown above.

13	(a)		5r	1	B1
	(b)		14t	1	B1
	(c)		2ab	1	B1

15	(a)		10	1	B1 cao
	(b)		13	1	B1 cao
	(c)		8	1	B1 cao
	(d)		5	2	M1 for 7×-1 (= −7) and 4×3 (=12) A1 cao

11	(a)		24	3	M1 for 4×10 (= 40) M1 for operations –"40" then ÷ 7 in correct order or 20 A1 cao
	(b)		$35e$	2	M1 for $7 \times e$ or $5 \times e$ or $7 \times 5 \times e$ oe A1 for $35e$ (ignore £ signs)

14	(a)		$5m$	1	B1 cao
	(b)		$4pr$	1	B1 cao
	(c)		$7x + 3y$	2	B2 for $7x + 3y$ oe (B1 for $7x$ or $3y$ seen)

PAPER: 1MA0_2F

Question	Working	Answer	Mark	Notes
23 (a)		20.3	2	M1 for $\frac{50}{1.57^2}$ oe A1 for answer in range 20.2 to 20.3
(b)		68.04	2	M1 for (m =) $1.8^2 \times 21$ oe A1 cao
(c)		2.61	3	M2 for a complete method to find 145% of 1.8, eg. $\frac{145}{100} \times 1.80$ oe (M1 for a method to find 45% of 1.8, eg. $\frac{45}{100} \times 1.80$ (= 0.81) or for a multiplication factor of 1.45) A1 cao

16			$\frac{x+10+x+x-4}{3}$	3	M1 for $x + 10$ or $x - 4$ M1 for $x + 10 + x + x - 4$ A1 for $\frac{x+10+x+x-4}{3}$ oe

PAPER: 5MB2F/01

Question		Working	Answer	Mark	Notes
16			$A = 13x + 8$	3	M1 for $5(2x + 1)$ or $3(x + 1)$ or $5 \times 2x + 1 + 3 \times x + 1$ M1 for $5(2x + 1) + 3(x + 1)$ or $13x + 8$ oe A1 for $A = 13x + 8$ oe OR M1 for $8(x + 1)$ or $5x$ or $8 \times x + 1 + 5x$ M1 for $8(x + 1) + 5x$ or $13x + 8$ oe A1 for $A = 13x + 8$ oe OR M1 for $8(2x + 1)$ or $3x$ or $8 \times 2x + 1 - 3x$ M1 for $8(2x + 1) - 3x$ or $13x + 8$ oe A1 for $A = 13x + 8$ oe

9			–3	3	M1 for full substitution or –12 or 9 M1 for –12 + 9 A1 cao

4	(a)	ruler, pen ruler, pencil, eraser ruler, 3 erasers **or**	3	2	M1 for at least one correct way listed in words or as costs **or** for answer of 3 A1 for 3 **and** the three correct ways listed in words or as costs
	(b)	$7 \times 30 + 3 \times 45 = 3.45$ $5.00 - 3.45 =$	1.55	3	M1 for 7×30 (= 210) or 3×45 (= 135) M1 (dep on previous M1) for £5 – their **total** of 7×30 and 3×45 **or** digits 155 seen A1 for 1.55 cao **B1 SC** for 4.25
	(c)		$20y$	1	B1 for $20y$ oe

PAPER: 1MA0/1F

11	(a)		$3h$	1	B1
	(b)		$3pr$	1	B1
	(c)		$2x + 7y$	2	M1 for $2x$ or $7y$ A1 for $2x + 7y$
	(d)		22	2	M1 for correct substitution e.g. $2 \times 5 + 4 \times 3$ A1 cao

PAPER: 1MA0/1F

10	(a)		4 : 3	2	M1 for 20 : 15 or 3 : 4 A1 cao
	(b)		$35 - x - y$	2	M1 for $20 - x$ or $15 - y$ A1 for $20 - x + 15 - y$ oe

4	(a)		6	1	B1 cao
	(b)		4	1	B1 cao
	(c)		6	1	B1 cao
	(d)		3.25	2	M1 for method to isolate the q term or division by 8 through as the first step A1 oe
	(e)		19	2	M1 for substitution eg $4+5\times3$ A1 cao

PAPER: 5MB3F_01

Question	Working	Answer	Mark	Notes
13 (a)		−7	2	M1 for substitution eg $4 \times 2 - 3 \times 5$ A1 cao
(b)		9	2	M1 for substitution eg $30 = 4x - 3 \times 2$ or $\frac{30+6}{4}$ or $y + 3t = 4x$ oe A1 cao

16	(a)		$7x$	1	B1 cao
	(b)		$6y$	1	B1 cao
	(c)		$8e - 2e^2$	2	B2 or any correct two term factorised form (B1 for $8e$ **or** $-2e^2$)

Paper: 1MA0/1F				
Question	**Working**	**Answer**	**Mark**	**Notes**
*17		45	4	M1 for complete method to find angle *ABC* e.g. (180 − 70) ÷ 2 (= 55) M1 for complete method to find *x* e.g. angle *CBD* = 180 –"55" (= 125) **and** "125" – 80 A1 cao C1 base angles of an isosceles triangle are equal **and** the sum of the angles in a triangle is 180 **and** the sum of the angles on a straight line is 180 **or** M1 for complete method to find angle *BAC* e.g. (180 − 70) ÷ 2 (= 55) M1 for complete method to find *x* e.g 70 + "55" (= 125) **and** "125" −80 A1 cao C1 base angles of an isosceles triangle are equal **and** the exterior angle of a triangle is equal to the sum of the two interior opposite angles

3	(a) (b)		56*ef* 12.5	B1 B1	cao oe

16		$-\frac{1}{2}$	M1 A1	for substitution with operations shown e.g. $1 + -3 \times \frac{1}{2}$ **or** $1 - \frac{3}{2}$ **or** $1\frac{1}{2}$ **or** $-1\frac{1}{2}$ oe

Question	Working	Answer	Mark	Notes
1 (a)		$3p$	B1	cao
(b)		$2m^3$	B1	cao
(c)		$10 - 4c + 6d$	M1	for $-4c$ or $6d$ (accept $+-4c$)
			A1	for $10 - 4c + 6d$

2		$12p + 18b$	M1 A1	$12p$ or $18b$ or $p + b$ $12p + 18b$

6		$L = 5a + 3$	M1 M1 A1	for expression $a - 1 + a + a + a + a + 4$ **or** L= an expression in a for $5a + 3$ **or** $L = a + a + a - 1 + a + a + 4$ oe for $L = 5a + 3$

3	(a)		$15fg$	B1	cao
	(b)		t^2	B1	cao
	(c)		$4n$	B1	cao

2		$2y$	B1	for $2y$

6	(a)	$12t$	B1	$12t$	Accept $t12$ but **not** $12 \times t$ or $t \times 12$
	(b)	$7a$	B1	$7a$	Accept $a7$ or $7 \times a$ or $a \times 7$ Partial simplification of $5a + 2a$ or $8a - a$ does NOT get the mark

Paper: 1MA1/1F

Question		Answer	Mark	Mark scheme	Additional guidance
20	(a)	m^7	B1	cao	
	(b)	$125n^3p^9$	B2	cao	Allow multiplication signs
			(B1	for 2 of 3 terms correct in a single product)	$125n^3p^x$ or $125n^xp^9$ where $x \neq 0$ or an^3p^9 where a is a number
	(c)	$8q^6r^3$	B2	cao	Allow multiplication signs
			(B1	for 2 of 3 terms correct in a single product)	$8q^6r^x$ or $8q^xr^3$ where $x \neq 0$ or aq^6r^3 where a is a number

7	(a)	$4m$	B1	cao	
	(b)	$8np$	B1	cao	

10	(a)	38	B1	cao	
	(b)	6	M1	starts process to find input using inverse operations eg 28 + 2 **or** sight of +2 ÷ 5 **or** by forming an equation eg $x \times 5 - 2 = 28$	+2 ÷ 5 could be seen in a flow diagram
			A1	cao	

25	7	P1 P1 A1	process to use gradient eg $y = 3x + c$ **or** $c = -6$ **or** $\frac{15-9}{d-5}$ **or** $(15 - 9) \div 3$ **or** (6, 12) (dep) full process to rearrange equation formed to isolate d eg rearrangement of $15 = 3d - 6$ or $3 = \frac{15-9}{d-5}$ **or** for $5 + \frac{15-9}{3}$ cao	Condone use of a letter other than d, for d Must show processes to get as far as $d =$ Award P2 for an answer of (7, 15)

Paper: 1MA1/2F

13	$10x$	B1	for $10x$ oe	

Paper: 1MA1/1F

7	$7y$	B1	for $7y$ oe	Accept $7 \times y$ oe Accept a formula, eg. $P = 7y$ but **not** $y = 7y$

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
8 (a)	$7ab$	B1	for $7ab$	
(b)	y^3	B1	cao	
(c)	$\frac{e}{f}$	M1	for a correct first step, eg. numerator of $e^3 \times f$ or denominator of $e^2 \times f^2$ **OR** $e \div f$ or $e \times f^{-1}$ **OR** relevant crossings out for all the e's **and** all the f's	
		A1	for $\frac{e}{f}$ or ef^{-1}	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
11	23	M1 A1	for substitution eg. 7×5 and 3×−4 or 7(5) + 3(−4) cao	7×5 (= 35) and 3×−4 (= −12) may be seen separately but both must be seen for the award of M1

25	8.3 and 8.4	B1 B1	for 8.3 in the correct position for 8.4 in the correct position	 Accept $8.3\dot{9}$ or 8.399…

Question	Answer	Mark	Mark scheme	Additional guidance
9	$11e + 5f$	M1 A1	for either $11e$ or $5f$ for $11e + 5f$	

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	330	M1	for 4 × 70 + 50 oe	May be seen as sum of four 70s and a 50 n × (70 + 50) or ambiguous working gets 0 marks
		A1	cao	
(b)	9	M1	for use of inverse operations eg (680 – 50) ÷ 70 **OR** rearranges an equation to solve eg $70x + 50 = 680$ rearranged to isolate x term. **OR** ft (a) eg ((680 – "330") ÷ 70) + 4	Need not have brackets; can be written in an incorrect order if the intention is clear A correct but embedded answer gets 1 mark
		A1	cao or ft their (a)	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)	$10ab$	B1	cao	
(b)	$8x + y$	M1	for $8x$ or y	Accept $1y$ for 1 or 2 marks
		A1	for $8x + y$	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
21	2 (supported)	P1 P1 P1 A1	for a process to find the number of men, eg. (60 ÷ 2) ÷ 3 (= 10) for a process to find the number of children, eg. 60 – "30" – "10" (= 20) for a start of a process to find the value of *n*, eg. ("20" : "10") ÷ 5 or 20 : 10 = 10 : 5 or "20" ÷ "10" for 2 with supportive working	 60 ÷ 3 = 20 scores no marks. Any ratio must come from correct processes to find the number of children and the number of men Award 0 marks for 2 with no correct supportive working Award full marks for 2 : 1 given as final answer from correct supportive working

8	(a)	43	B1	cao	
	(b)	– 20 or ÷ 3	B1	for ÷ 3 **or** – 20 **or** $\times\frac{1}{3}$ **or** + –20	

Paper: 1MA1/2F

18	(a)	$T = 4n - 5$	M1	for $2n$ **or** $n - 5$ **or** $T =$ a linear expression in n	Allow variables other than n
			M1	for $n + 2n + n - 5$ oe **OR** for $T =$ an expression in n with 2 of 3 ages correct eg $T = n + n^2 + n - 5$	Each age must be an expression in n
			A1	for $T = 4n - 5$ oe eg $T = n + 2n + n - 5$	
	(b)	$5m - 3m = 2m$	B1	for $5m - 3m = 2m$ indicated	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
20	Shown (supported)	M1	for substitution eg $4 \times 110 + 12$	
		A1	for 452	
		M1	(dep M1) for method to find value(s) needed for comparison eg $\frac{"452" - 442}{442} \times 100$ **OR** $\frac{5}{100} \times 442$ oe (= 22.1) **and** "452" – 442 (= 10) **OR** $\frac{5}{100} \times 442 + 442$ oe (= 464.1) **and** "452"	
		C1	shown with correct comparable values eg 2.2(6...)(%) **OR** 22.1 **and** 10 **OR** 452 **and** 464.1	

Paper: 1MA1/2F

28	6	M1 M1 A1	for 720 ÷ 40 (= 18) **or** 720 ÷ 30 (= 24) for a complete process eg (720 ÷ 30) – (720 ÷ 40) **or** "18" × 4/3 – "18" **or** "24" – "24" × 3/4 cao	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	11	B1	cao	
(b)	22	M1	Starts to find input using inverse operations, 41 + 3 (= 44) **or** sight of +3 **and** ÷2 **or** derivation of equation eg $2n - 3 = 41$	+3 and ÷2 could be seen in a flow diagram Evidence could be provided by algebraic statement, numerical statements or by diagrams
		A1	cao	

30	(a)	$q = \frac{p-7}{6}$	M1	for a correct first step, showing a method of subtraction of 7 from both sides or division of all terms by 6 eg $p - 7 = 6q + 7 - 7$ **or** $\frac{p}{6} = \frac{6q}{6} + \frac{7}{6}$ oe	
			A1	for $q = \frac{p-7}{6}$ **or** $q = \frac{p}{6} - \frac{7}{6}$	Allow $1\frac{1}{6}$ for $\frac{7}{6}$ Award for answer without "$q =$"
	(b)	m^6	B1	cao	

Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 1F

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
1		The wording "Write the following numbers…" removed and replaced by "Write the following four numbers…"	Standard mark scheme
2		The wording "Here is a list of numbers" removed and replaced by "Here is a list of five numbers."	Standard mark scheme
6		Wording added "Look at the diagrams for Question 6 in the Diagram Book. They show two probability scales." The spinner kept in the question paper and the spike removed. A dot added at the centre of the spinner. Spinner enlarged with the text. Wording added "On the probability scale for Question 6(a), mark…" Wording added "On the probability scale for Question 6(b), mark…" Probability scales kept on the same page in the Diagram Book but enlarged. Numbers moved above the probability scales. The wording "with a cross (x)" removed	Standard mark scheme

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
7		Wording added Look at the diagram for Question 7 in the Diagram Book. It shows an incomplete pictogram which…" Diagram enlarged. Key moved above the pictogram. The ovals changed to circles.	Standard mark scheme
8		Wording added "Look at the diagram for Question 8 in the Diagram Book. It shows point A and point B on a coordinate grid." Diagram enlarged. Open headed arrows. Crosses changed to dots. The point B moved to (1,-1); difficult for the candidate to see as it currently lies on the axis. In part (c) the wording "with a cross (x)" removed.	Standard mark scheme for part (a) and (c), but part (b) is now (1, –1) B1 cao
11		Wording added "Look at the diagram for Question 11 in the Diagram Book. It shows a shaded shape on a grid. A cut out shape may be available if you wish to use it". Shape provided for all candidates. Diagram enlarged. Shading changed to dotty shading. Add wording "mirror line" to the other side of the line. "You do not need to shade your shape."	Standard mark scheme
12		Wording added "Look at the diagram for Question 12 in the Diagram Book." The wording "The diagram shows…" removed and replaced with "It shows…" Diagram enlarged. Open headed arrows.	Standard mark scheme

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
13		North lines made 9 cm. A line added between points A and B and made 10cm long to allow them to measure the angle. The angle will be kept the same, but this will change the answer to Question 13(b). Wording added "Look at the diagram for Question 13 in the Diagram Book. It is accurately drawn." Open headed arrows. Scale to be moved above the diagram. Some enlarged scripts have distance *AB* measuring 7 cm For these scripts the scheme for 13(b) reads: **M1** for measurement of *AB* in the range 6.5 to 7.5 cm; accept 65 to 75 if identified as mm **M1** for "7" × 25000 (= 175000) or "7" ÷ 100000 (= 0.00007) or 25000 ÷ 100000 (= 0.25) "7" can be a figure in mm if previous M1 awarded but appropriate conversions to km then apply For the award of this mark, "7" or "70" can be any value in the range 5.5 to 8.5 or 55 to 85 **A1** for answer in the range 1.625 to 1.875 Note: If the length of AB differs from those exemplified, amend the ranges of acceptable values accordingly	<u>Part (a):</u> for angle in the range 20 to 30 Accept without the initial 0 <u>Part (b):</u> **M1** for measurement of *AB* in the range 9.5 to 10.5 cm; accept 95 to 105 if identified as mm **M1** for "10" × 25000 (= 250000) or "10" ÷ 100000 (= 0.0001) or 25000 ÷ 100000 (= 0.25) "10" can be a figure in mm if previous M1 awarded but appropriate conversions to km then apply For the award of this mark, "10" or "100" can be any value in the range 8 to 12 or 80 to 120 **A1** for answer in the range 2.375 to 2.625

<table>
<tr><th colspan="4">PAPER: 1MA1/1F</th></tr>
<tr><th colspan="2">Question</th><th>Modification</th><th>Mark scheme notes</th></tr>
<tr><td>14</td><td></td><td>Wording added “Look at the table for Question 14 in the Diagram Book.”
The wording “Complete the two-way table” removed and replaced by “Complete the two-way table in the Diagram Book.” Wording added “There are ten spaces to fill.” Table enlarged.
Braille only: Table labelled (i) to (x).
<table>
<tr><td></td><td>Cricket</td><td>Tennis</td><td>Swimming</td></tr>
<tr><td>Male students</td><td>(iv)</td><td>(ii)</td><td>(v)</td></tr>
<tr><td>Female students</td><td>(vii)</td><td>(viii)</td><td>(i)</td></tr>
<tr><td>Total</td><td>(iii)</td><td>(ix)</td><td>(x)</td></tr>
</table>
Sticky labels of all the answers provided for braille candidates. They will still have to work out the correct answers for 10 spaces and place them into the correct space.</td><td>Standard mark scheme</td></tr>
<tr><td>16</td><td></td><td>Wording added “Look at the table for Question 16 in the Diagram Book.” Table enlarged.
The wording “The table gives information…” removed and replaced by “It gives information…”</td><td>Standard mark scheme</td></tr>
<tr><td>19</td><td>(c)</td><td>The letter f changed to p.</td><td>Standard mark scheme except for the letter changes indicated.</td></tr>
</table>

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
22		Wording added "Look at the diagram for Question 22 in the Diagram Book." The wording "The diagram shows four graphs" removed and replaced by "It shows four graphs labelled graph A, graph B, graph C and graph D." Diagrams enlarged. Graph lines made thicker. Open headed arrows. Headings moved above the graph.	Standard mark scheme
23		Wording added "Look at the diagram for Question 23 in the Diagram Book." The wording "The diagram shows four triangles" removed and replaced by "It shows four triangles." Diagram enlarged. Headings moved above the diagrams. Angles moved outside of the angle arcs and the angle arcs made smaller. Triangles straightened up so a 10 cm side lies horizontally. Braille only: Description added of the triangles.	Standard mark scheme
25		The wording "ADC is a triangle" removed. Diagram enlarged. Wording added "Look at the diagram for Question 25 in the Diagram Book. It shows the triangle ADC." Angles moved outside of the angles arcs and the angle arcs made smaller.	Standard mark scheme
26		Wording added "Look at the table and the diagram for Question 26 in the Diagram Book." Wording "This stem and leaf diagram shows…" removed and replaced with "The stem and leaf diagram shows…" The wording "…of a group of Year 9 girls" removed and replaced by "…of a group of girls in Year 9". The wording "…of a group of 15 Year 9 boys" removed and replaced by "…of a group of 15 boys in Year 9". Table enlarged and kept on the same page as the stem and leaf diagram. Diagram enlarged and a tracking line added. Key moved above the diagram.	Standard mark scheme

PAPER: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
27		Model provided for all candidates with a base added to represent the horizontal floor. Wording added "Look at the diagram for Question 27 in the Diagram Book. You may be provided with a model." The wording "The diagram shows a prism…" removed and replaced by "The diagram and the model show a prism…". Diagram enlarged. Dashed lines to be made thicker and longer. The pressure formula to be kept in the Question Paper and moved to the left of the diagram in the Diagram Book.	Standard mark scheme
28		The wording "Write these numbers in order of size" removed and replaced by "Write these four numbers in order of size."	Standard mark scheme
29		The letter a changed to w. The letter b changed to x. The letter c changed to y.	Standard mark scheme except for the letter changes indicated.

3	6*e*	B1		

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	–13	M1	for substitution eg 3×5 and 4×-7 **or** 15 and –28	3×5 (= 15) and 4×-7 (= –28) may be seen separately but both must be seen for the award of M1
		A1	cao	35 and 4–7 do not get the mark unless multiplication is shown eg 35 = 15 is evidence of multiplication and should not be seen as choice
(b)	5	M1	for $38 = 3 \times 6 + 4y$ **or** $38 - 18$ (=20) **or** for a complete method to make y the subject eg $y = \frac{T - 3x}{4}$	eg $y = (T - 3x) \div 4$
		A1	cao	

25	99.5	M1 A1	for $\sin(34) = \frac{x}{178}$ oe **or** alternative method to find x for answer in range 99.5 to 99.7	If an answer in the range 99.5 to 99.7 is given in the working space then incorrectly rounded, award full marks

14	(a)	$5x + y$	M1	for method to collect terms, eg $5x$ or y	May be seen in working. Accept if no ambiguity. Accept $1y$.
			A1	cao	
	(b)	3	M1	for subtracting 7 from both sides or dividing each term by 5 as a first step, eg $5p = 15$ or $5p = 22 - 7$ or $\frac{5p}{5} + \frac{7}{5} = \frac{22}{5}$	Must be carried out, not just intention. Division by 5 must be all terms.
			A1	cao	

Paper: 1MA1/3F

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	n^8	B1	cao	
(b)	cd^3	M1	for partial simplification, eg c or d^3	May be seen as simplification in original fraction
		A1	for cd^3	Accept c^1d^3
(c)	$x > \frac{14}{5}$	M1	for $5x > 14$ or $5x = 14$ or critical value, $\frac{14}{5}$ oe	Must see carried out correctly, ie at least $5x > 7 \times 2$ not just intention seen. Allow other signs for this mark.
		A1	$x > \frac{14}{5}$ or $x > 2\frac{4}{5}$ or $x > 2.8$	

4	(a)	$4m$	B1	cao	
	(b)	$3p$	B1	cao	

13	(i)	21	M1	for 180 – 75 – 84	
			A1	cao	Angle may be indicated on the diagram
	(ii)	Reason given	C1	for reason that Angles on a straight line add up to 180	The key words underlined must be present There should be no incorrect reasons given

Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	c^3	B1	cao	
(b)	d^{12}	B1	cao	

6	(a)	$4ab$	B1		
	(b)	$3x + 8$	M1	for method to collect terms eg $3x$ or 8	May be seen in working. Accept if no ambiguity.
			A1	for $3x + 8$	

11	(a)	3 hrs 16 mins	P1	196 − 60 − 60 − 60 (=16) oe **or** 196 ÷ 60 (= 3.26.. or 3.27…) **or** states 3 hours in their answer (with an incorrect number of minutes or minutes left blank)	
			A1	3 hours 16 minutes	
	(b)	$\frac{x}{2}$	B1	$\frac{x}{2}$ oe	

2	$4e$	B1	for $4e$ oe	e^4 gets no marks, where the 4 is clearly a power

14	19	M1 A1	for a correct substitution, eg (y =) 6 × 4 – 5 cao	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	9	B1	cao	
(b)	6	M1	starts to find input using inverse operations eg $154 \div 11$ (= 14) **or** indicates $\div 11$ **and** -8 **or** derivation of equation eg $(8+ n) \times 11 = 154$ **or** starting to solve for unknown eg $154 - 8 \times 11$ (= 66)	$\div 11$ and -8 could be seen in a flow diagram Evidence could be provided by algebraic statement, numerical statements or by diagram
		A1	cao	

4	$6m$	B1	for $6m$	

Question	Answer	Mark	Mark scheme	Additional guidance
24	1.5	P1	for process to develop 3 algebraic expressions, eg. (R =) n, (S =) $2n$, (T =) $2n – 6$, oe, at least two must be correct. **or** for selecting 3 values satisfying the given criteria, eg. (R =) 10, (S =) 20, (T =) 14	
		P1	for process to sum 3 algebraic expressions and equating to 54, eg. n + “$2n$” + “$2n – 6$” = 54 **or** for finding the correct sum of their values eg. “10” + “20” + “14” = 44	
		P1	for start of process to solve the correct linear equation, eg. $5n = 54 + 6$ ($n = 12$) **or** for 12, 24, 18	
		P1	for “12” : 2 × “12” – 6 oe eg 12 : 18 oe or 18 : 12 linked to T, R	
		A1	for 1.5 or $\frac{3}{2}$ or $1\frac{1}{2}$	Accept 1 : 1.5 etc as answer

Paper: 1MA1/3F

5	$15tw$	B1	for $15tw$	May be seen in different order

21	2^6	M1 A1	for the start of a method of simplification, eg 2^{-5+8} (= 2^3) or $2^{-5\times2}$ (= 2^{-10}) or $2^{8\times2}$ (= 2^{16}) cao SC B1 for answer of 64 or 8^2 or 4^3 if M0 scored.	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
14 (a)	$7c + 6d$	M1	for $7c$ **or** $6d$	
		A1	for $7c + 6d$	
(b)	7	M1	for correct method to expand, eg $5 \times 2m - 5 \times 6$, **or** divides both sides by 5 as a first step.	
		M1	for correct method to isolate terms in m, eg $10m - 30 + 30 = 40 + 30$	
		A1	cao	
(c)	$3x + 2y$	M1	for $3x$ or $2y$	Condone use of b and p
		A1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
22	8.73	M1	for a correct trig statement, eg 14.5 × cos 53 or cos 53 = x ÷ 14.5	Can use a combination of skills but must have only one unknown in x to score this mark
		A1	answer in the range 8.726 to 8.73	If an answer is given in the range in working and then rounded incorrectly award full marks.

Question	Answer	Mark	Mark scheme	Additional guidance
18	$T = 5b + 28c$	M1	for $5b$ **or** $28c$ **or** T = a linear expression in b and/or c	Allow $5 \times b$ and $28 \times c$ throughout
		M1	for $5b + 28c$ **or** partially correct formula, eg $T = 5b$ $(+ kc)$ oe **or** $T = 28c$ $(+ kb)$ oe	
		A1	for $T = 5b + 28c$ oe	

4	$12t$	B1	for $12t$	

3	$4m$	B1		

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
19	2.5	P1	for $450 \div 6$ (= 75) **or** statement $450 = \frac{3000 \times 6 \times y}{100}$ oe **or** $\frac{450}{3000}$ (= 0.15) or $\frac{450 \times 100}{3000}$ (= 15)	
		P1	for "75" $\div$ 3000 (= 0.025) **or** (y =) $\frac{450 \times 100}{3000 \times 6}$ oe **or** $\frac{"0.15"}{6}$ (= 0.025) or $\frac{"15"}{6}$ **or** $\frac{3000 + "75"}{3000}$ (= 1.025)	
		A1	cao	

3	12*a*	B1		

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)(i)	26	M1	for substitution eg $2 \times 3 + 4 \times 5$ or $6 + 20$	
		A1	cao	
(ii)	13	M1	for substitution eg $38 = 2g + 4 \times 3$ **or** a complete numerical method eg $(38 - 4 \times 3) \div 2$ **or** for a correct first step to rearrange eg $P - 4h = 2g$ or $\frac{P}{2} = g + \frac{4h}{2}$ oe	
		A1	cao	
(b)	–11	M1	for $3 \times -3 = -9$ oe **or** a full substitution eg $(3 \times -3) - 2$	Condone absence of brackets
		A1	cao	

13	(a)	$20h^3$	B1	cao	
	(b)	$7y$	B1	cao	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	16	B1	cao	
(b)	19	M1	starts method to find input using inverse operations eg 28 + 10 (=38) **or** sight of +10 and ÷2	+10 and ÷2 could be seen in a flow diagram Working may be next to number machine.
		A1	cao	
(c)	Shown	M1	for carrying out at least one trial **or** for forming a suitable equation, eg $2x - 10 = x$ **or** for identifying 10	Trial can be for any value, must be correctly evaluated. Accept correct inverse function trial, correctly evaluated. If working seen on the number machine provided in the question allow for a trial other than input 13 or output 28.
		C1	for showing that an input of 10 gives an output of 10	Allow $10 \times 2 = 20 - 10 = 10$ for M1C1

5	2	B1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)	$6cd$	B1	for $6cd$ or $6dc$ or $cd6$ oe	Inclusion of × scores B0, eg $6 \times cd$ oe
(b)	-5	M1	for $3 + 2 \times -4$ $(= 3 - 8)$	
		A1	cao	

4	$3a$	B1	for $3a$	Allow $a3$

16	(a)	m^4	B1	cao	
	(b)	$5x + 2y$	M1	for $5x$ **or** $2y$ **or** a linear expression in the form $ax + by$ where $a, b > 0$	Do not award M1 for $-5x$ or $-2y$
			A1	for $5x + 2y$ oe	

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)	8	M1 A1	for 11 + 5 (= 16) cao	
(b)	– 3 or × 0.7	P1	for 28 ÷ 4 (= 7) **or** 10 – 3 (= 7) **or** 10 × 0.7 (= 7)	7 may be seen next to function machine or embedded within a calculation Accept $+-3$ or $\times\frac{7}{10}$
		A1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
21	180 – 4*e* and reason	M1	for angle *ACD* = *e* **or** for angle *ADC* + angle *BAD* = 180 **or** for angle *BAX* = 3*e* (where *X* lies on *DA* extended)	Angles must be clearly labelled on the diagram or otherwise identified
		A1	for 180 – 4*e* oe	May be unsimplified
		C1	(dep M1) for an appropriate reason relating to parallel lines from alternate angles are equal or allied angles / co-interior angles add up to 180 or for corresponding angles are equal	Underlined words need to be shown Reason needs to be linked to their method, which can be implied from correctly identified angles (stated or written on the diagram)

11	(a)	$6xy$	B1	cao	
	(b)	$5d - 3e$	M1	for $5d$ **or** $-3e$	An answer of $5d + -3e$ scores M1 A0
			A1	for $5d - 3e$	

Question	Answer	Mark	Mark scheme	Additional guidance
27	3.125×10^7	M1	for $(k =)\ (1.25\times10^{-12})\div(4\times10^{-20})$ **or** for the digits 3125	Condone missing brackets on division 3.1×10^7 or 3.12×10^7 or 3.13×10^7 will score M1A0
		A1	cao	

12	$6x + 7y$	M1 A1	for $6x$ **or** $7y$ **or** a linear expression in the form $ax + by$ where $a, b > 0$ for $6x + 7y$ oe	 $T = 6x + 7y$ oe scores M1A0

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
25 (a)	$14x^5y^6$	B2	cao	
		(B1	for correct simplification of two terms ax^5y^6 **or** $14x^by^6$ **or** $14x^5y^c$ where $a \neq 14, b \neq 5, c \neq 6$)	Where a, x^b, y^c can be made up of two products Condone inclusion of multiplication signs for B1
(b)	m^{-6}	B1	for m^{-6} or $\frac{1}{m^6}$	

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
1	5*e*	B1	cao	

9	(a)	$x - 5$	B1	cao	Allow $-5 + x$
	(b)	$2x$	B1		Allow $x + x$ or $x2$ or $x \times 2$ or $2 \times x$
	(c)	3	B1	cao	

Paper: 1MA1/1F

13	(a)	10	B1	cao	May be seen by machine
	(b)	– 1	M1	starts method to find input using inverse operations eg $-11+8\ (=-3)$ **or** sight of $+8$ and $\div 3$	Allow $--8$ for $+8$ Allow $\times \frac{1}{3}$ for $\div 3$ Do not allow a misread of 11 for -11
			A1	for – 1	Embedded answer eg $-1\times 3-8=-11$ scores M1A0

Paper: 1MA1/1F

Paper: 1MA1/1F

Question	Answer	Mark	Mark scheme	Additional guidance
22 (a)	4.5	P1	for a process to find the number of dark chocolates, eg $280 \times \frac{1}{7}$ oe (= 40)	
		P1	for a process to find one part of the ratio for milk chocolates to white chocolates eg (280 – "40") ÷ (1 + 3) (= 60)	
		P1	for process to find the number of white chocolates, eg "60" × 3 (= 180) or 280 −"40" −"60" (= 180)	Condone milk, white incorrectly labelled
		P1	for a ratio of white chocolates : dark chocolates eg "180" : "40" oe or for a process to find the value of *n* eg "180" ÷ "40"	Labels not required for this mark, but if seen must be correct Must be a 2-part ratio. Allow "40" : "180" if labelled as dark chocolate : white chocolate oe
		A1	(dep P3) for 4.5 oe	A correct answer with no supportive working gets 0 marks Condone answer of 4.5:1
(b)	No with reason	C1	for No with reason **Acceptable examples** No, the number of dark chocolates and white chocolates has not changed No, the ratio of *n*:1 only involved white and dark chocolates No, eating milk chocolates doesn't change the rest No, the ratio of dark to white chocolates doesn't change. **Not acceptable examples** Yes,… No, it doesn't matter how many milk chocolates are eaten No, the number of white chocolates doesn't change No, the number of dark chocolates doesn't change	Reason must refer to or imply both dark and white chocolates

Paper: 1MA1/1F

2	$6n$	B1		Allow $n6$ but not $6\times n$ or $6.n$

9	(i)	65	M1 A1	for a complete method eg 180 – 85 – 30 **or** 360 – 180 – 85 – 30 cao	May be seen on the diagram 85 + 30 + 65 = 180 scores M1A0 unless 65 clearly identified
	(ii)	Reason	C1	for Angles on a straight line add up to 180 **or** Angles at a point add up to 360	Reason must be for their chosen method If M0 awarded in (i) answer must be in the range 35 to 95 to award C1 Underlined words must be seen Condone use of ∠s for angles

13	(a)	n^3	B1	cao	
	(b)	6	M1	for isolating k terms, eg $5k = 26 + 4$ or $5k = 30$ **or** $k - \frac{4}{5} = \frac{26}{5}$ oe **or** $26 + 4 \div 5$	For M mark step must be carried out not just intention shown. For example, if you see $5k - 4 = 26$ $+4 \quad +4$ award M1 for $5k = r$ where $r > 26$
			A1	cao	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
25	370	P1	for finding the mean of list **A**, eg (276 + 400 + 157 + 139) ÷ 4 (= 243) **OR** for an expression for the mean of list **B**, eg $(530+500+270+x+440+320)\div 6\left(=\frac{2060+x}{6}\right)$ oe	
		P1	for beginning to work with ratio, eg "243" ÷ 3 (= 81) or [A] ÷ 3 **or** "243" × 5 (= 1215) or [A] × 5 **OR** $"\left(\frac{2060+x}{6}\right)"\times 3$ **or** [B] × 3 **or** $"\left(\frac{2060+x}{6}\right)"\div 5$ **or** [B] ÷ 5	[A] is what they believe to be the mean for **A** [B] must be clearly their mean of **B** and be an expression including x
		P1	for completing the work with ratio, eg "81" × 5 (= 405) **or** [A] ÷ 3 × 5 **or** [B] × 3 ÷ 5 **or** $"\left(\frac{2060+x}{6}\right)"\times\frac{3}{5}$ **OR** forms a suitable equation, eg $"243"\times 5=3\times"\left(\frac{2060+x}{6}\right)"$ or $[A]\times 5=3\times"\left(\frac{2060+x}{6}\right)"$	
		P1	for working with mean of list **B**, eg "405" ×6 (= 2430) or [A] ÷ 3 × 5 × 6 **OR** for process to remove brackets and denominator, eg $"243"\times 5\times 2=2060+x$ or [A] × 5 × 2 = 2060 + x or 2060 + x = "405" × 6	
		A1	cao	

Paper: 1MA1/2F

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Mark Scheme (Results)

November 2011

Modular Mathematics (GCSE)
Unit 2: 5MB2F_01 (Foundation)

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i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations
Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers
Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

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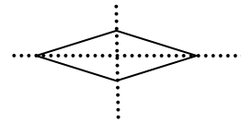
5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		rhombus	1	B1 cao
	(b)			1	B1 for both lines seen do not accept any extras but accept freehand Lines.
2	(a)		10 570	1	B1 for 10 570
	(b)		560	1	B1 cao
	(c)		2.17, 3.95, 5.03, 6.84	1	B1 cao
	(d)(i)		49	1	B1 cao
	(ii)		8	1	B1 cao
3	(a)		8.6	1	B1 for 8.6 ± 0.2 cm
	(b)		correct ×	1	B1 for × 5 cm from Q ± 0.2 cm use overlay provided
	(c)(i)		obtuse	2	B1 ignore spelling
	(ii)		120		B1 for 120 ± 2°

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5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
4		2 × 60 + 3 × 50 = 120 + 150 = 270 7 × (45 + 55) = 700 1500 – 970 **or** 2 × 60 + 3 × 50 + 7 × 45 +7 × 55 120 + 150 + 315 +385 = 970 1500 – 970 = **or for doubling travel costs** 2 × 2 × 60 + 2 × 3 × 50 = 240 + 300 = 540 7 × (45 + 55) = 700 1500 – 1240 = 260	530	4	M1 for 2 × 60 or 3 × 50 or 7 × 45 or 7 × 55 oe M1 for '2 × 60' + '3 × 50' + '7 × 45' + '7 × 55' oe M1 for 1500 – ('2 × 60' + '3 × 50' + '7 × 45' + '7 × 55') oe A1 cao **or** M1 for 2 × 60 or 3 × 50 or 45 + 55 oe M1 for '2 × 60' + '3 × 50' + '(45 + 55)' × 7 M1 for 1500 – ('2 × 60' + '3 × 50' + '(45 + 55) × 7)' oe A1 cao **Or for doubling travel costs** M1for 2 × 2 × 60 or 2 × 3 × 50 or 7 × 45 or 7 × 55 oe M1for '2 × 2 × 60' + '2 × 3 × 50' + '7 × 45'+ '7 × 55' oe M1for 1500 – ('2 × 2 × 60' + '2 × 3 × 50' + '7 × 45' +'7 × 55') oe A1 for 260
5	(a) (b)(i) (ii)		2 Monday 7	1 2	B1 cao B1 for Monday oe B1 ft for their (b)(i) accept positive and negative answers for 7
6	(a) (b)		5.6 9.58	1 1	B1 cao B1 ft from their weight in part (a) may be shown by selecting correct value in the table
7	(i) (ii)		70 reason	2	B1 for 70 look for answer on diagram C1 for angles (on a) straight line (add up to) 180°

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5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*8		28 = (4+1) + (4+1) + (4+1) + (4+1) + (4+1) + 3 Buy 4 + 4 + 4 + 4 + 4 + 3 23 × 6 = 138 or 140 ÷ 6 (= 23 rem 2) 23 ÷ 4 = 5 free 23 + 5 = 28	Yes + reason	3	M1 for attempt to account for 1 free e.g. (4+1) + (4+1) ... with at least 2 seen e.g. 140÷24 = 5 so 5 free eg every £24 get 1 free e.g. 23lots of £6 so 5 free M1 for using £140 in a calculation that could lead to the correct conclusion (need not be explicit) or for a method that leads to a total cost of 138 C1 (dep on M1) for 'Yes' **and** reason eg "138" is less than 140 oe or "Yes" **and** "23 with 5 free gives £2" left over oe **NB** Needs a statement to this effect
9	(a)	$\frac{15}{100} \times 240$	36	2	M1 for 15 ÷ 100 or 10% + 5% attempted with correct values of 24 and 12 seen or 24 and 12 seen or 0.15 seen A1 cao
	(b)	240 ÷ 3	80	1	B1 cao
	(c)	80 : 60 = 8 : 6	4 : 3	2	M1 for any correct ratio eg 80:60, 40 : 30, 8 : 6 or 4 gap 3 seen without ratio sign or 4 dot 3 A1 for 4 : 3 or 4 to 3 **SC** B1 for an answer of 3:4 or 3 to 4 if M1 not scored

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5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)		16	1	B1for answer in range 15.5 to 16.5
	(b)		2.4	1	B1for answer in range 2.3 to 2.5
	(c)(i)		Debbie	1	B1 for Debbie
	(c)(ii)		Correct reason	1	C1for Debbie in Part (i) with a valid explanation e.g. It is higher **or** with a correct conversion ± 1 sq or Stefan in part (i) with an incorrect conversion but valid explanation Note: 6 mph = 9.6 km/h (accept 9-10) 10.5 km/h = 6.5625 mph (accept 6.4 – 6.8)
11	(a)		6	2	M1for any valid method e.g. drawing diagrams, counting in 2s which may be on the diagram or table of values A1cao
	(b)	*n*th term is $2n + 2$ so 50th term is $50 \times 2 + 2$	102	2	M1for $50 + 50 + 2$ or any other valid method A1cao
12			$4x + 9y$	2	B2for $4x + 9y$ (B1for $4x$ or $9y$ seen)

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)		17	1	B1 cao
	(b)		(5+3)×2+1	1	B1 cao
	(c)		24	1	B1 for 24 or + 24
	(d)	$\frac{7}{10} + \frac{1}{5} = \frac{7}{10} + \frac{2}{10}$ | | 1 | 5 | | 7 | | 35 | | 10 | 10 | 50 |	$\frac{9}{10}$	2	M1 for a suitable common denominator (multiple of 10) with one fraction out of two (not $\frac{7}{10}$) correct or 0.7 + 0.2 or all cells correct if cell method used A1 for $\frac{9}{10}$ oe, accept 0.9
*14		$96 \div 2^2$ $= 96 \div 4$ $= 24$	No + calculations	3	M1 for $96 \div 2^2$ oe A1 for 24 C1 dep on M1for "No" **with** a calculation to support their conclusion **SC B1:** for $96 \div 2$ **and** a correct conclusion seen **NB** To award the marks in this question working **must** be shown

5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)	Missing sides are $2x + 1$ and $3x + 3$ Perimeter = $5x + 1 + x + 3x + 2x + 3 + 2x + 1 + 3x + 3$ OR $2(5x + 1) + 2(2x + 3 + x)$	$16x + 8$	3	M1 for $5x + 1 - 3x$ or $2x + 3 + x$ or identifying a missing side as $2x + 1$ or $3x + 3$(maybe on the diagram) M1 for adding 5 or 6 sides from x, $5x + 1$, $3x$, $2x + 3$, '$2x + 1$', '$3x + 3$' where the missing sides are in the form $ax \pm b$ (a and $b \neq 0$) or $2(5x + 1) + 2(2x + 3 + x)$ oe A1 for $16x + 8$ oe for unsimplified expression
	(b)		$4x + 2$	1	B1 ft for ['$2(5x + 1) + 2(2x + 3 + x)$'] ÷ 4 or ("$16x + 8$") ÷ 4 oe where the answer is an algebraic expression in x

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5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
16		Big area = 144 Small area = 64 Area frame = 144 – 64 = 80 80 ÷ 4 **or** Area one piece is a trapezium ½ (12+8) × (12– 8)÷2 ½ × 20 × 2 = 20 **or** Area of rectangle + 2 triangles 8 × 2 + 2× (½ × 2 × 2) 16 + 4 **or** Area of rectangle – 2 triangles 12×2 – 2× (½ × 2 × 2) 24 – 4	20	4	M1 for 12 × 12 or 8 × 8 or 144 seen or 64 seen as area M1 for 12 × 12 – 8 × 8 or '144' – '64' or 80 seen as area M1 for (12 × 12 – 8 × 8) ÷ 4 or '(144 – 64)' ÷ 4 or '80' ÷ 4 seen as area A1 for 20 cao **or** M1 for 12 – 8 or 4 seen as difference in lengths M1 for height of trapezium = (12 – 8) ÷ 2 or '4' ÷ 2 or 2 M1 for area trapezium = ½ (12 + 8) × '2' oe A1 for 20 cao **or** M1 for ½ × (12 – 8) or 2 for width of frame M1 for 8 × 2 = 16 for rectangle M1 for 2× (½ × 2 × 2) or 4 for 2 triangles A1 for 20 cao **or** M1 for ½ × (12 – 8) or 2 for width of frame M1 for 12 × 2 = 24 for rectangle M1 for 2× (½ × 2 × 2) or 4 for 2 triangles A1 for 20 cao **NB** marks can be awarded for correct measurements indicated on the diagram **Note:**-If 80 seen on the answer line following a correct calculation of one piece of card, full marks can be earned

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5MB2F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
*17		Angle *ACB* = 35° (base angles of an isosceles triangle are equal) (angles in a triangle add up to 180) Angle *CAE* = 35° (alternate angles are equal) *x* = 360 – (100 + 90 + 35) = 135 (angles in a quadrilateral add up to 360°)	135	4	M1 for angle *ACB* = (180 – 110) ÷ 2 or 35 seen M1 for angle *CAE* = angle *ACB* or "35" (this could be marked on diagram) A1 *x* = 135 cao C1 (dep on M1) for alternate angles are equal or allied angles (co-interior angles) are supplementary (add to 180º) AND any one of • (base) or 2 angles of an isosceles triangle are equal oe • angles in a triangle (add up to) 180 • angles in a quadrilateral (add up to) 360° • angles in a pentagon (add up to)540º

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Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

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Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

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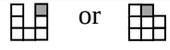
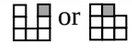
Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		E	1	B1 cao
	(b)		Cylinder	1	B1 for cylinder or circular prism. Use professional judgement re spelling of cylinder
	(c)		6	1	B1 cao
	(d)		8	1	B1 cao
2	(a)		507	1	B1 cao
	(b)		40	1	B1 for 40 or forty or 4 tens (do not accept an answer of "tens")
	(c)		6000	1	B1 for 6000 or six (6) thousand
3	(a)		43	1	B1 cao
	(b)	3 + 10	13	1	B1 cao
	(c)		7.1 – 7.9 inc.	1	B1 for answer in the range 7.1 – 7.9 inc
4	(a)		36 – 40 inc.	1	B1 for any answer in the range 36 – 40 inc.
	(b)		line	1	B1 for line of length 4.8 – 5.2cm inc.
5	(a)			2	B1 for 6 tins drawn for Thursday B1 for 3 + ½ tins drawn for Friday. Use professional judgement re sketch of semicircle
	(b)		15	2	M1 for (4.5 – 3)×10 or 1.5×10 or 4.5×10 – 3×10 or 45 – 30 or 10 + 5 A1 for 15

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		Tuesday	1	B1 for Tuesday (accept 8)
	(b)		– 6	1	B1 cao
	(c)		Wednesday or 8	2	B2 for Wednesday or 8 OR M1 for an attempt to find the difference in at least 3 of: 5 and 4, 8 and 6, 6 and -2, -1 and -4, -3 and -6; ie the answers need not be correct. A1 for Wednesday or 8
7	(a)		$\frac{3}{5}$	2	B2 cao (B1 for $\frac{9}{15}$ oe) [SC: B1 for an answer of $\frac{2}{5}$]
	(b)		0.9	1	B1 for 0.9 or 0.90 or .9
	(c)		No + reason	1	B1 for no and 0.75 or 80% or $\frac{75}{100}$ and $\frac{80}{100}$
8	(a)			1	B1 for 
	(b)			1	B1 cao

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1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)		No + reason	1	B1 for no and the (prob.) of red is (bigger than the (prob.) of blue. OR (prob.) of blue is nearer 0 OR (prob.) of red is closer to 1 OR (prob.) of red is 50% and the (prob.) of blue is about 20% oe
	(b)(i)		$\frac{4}{7}$	2	B1 for $\frac{4}{7}$ oe
	(ii)		0		B1 for 0 or $\frac{0}{7}$ or 0% (accept 0 out of 7, but not 0:7 or 0 to 7)
10		F + C + S 30 + 7 + 8 = 45 3×20 – 45 = 15	15	4	M2 for 30 + 7 + 8 (= 45) (M1 for 12 × 2 + 7 × 3 + 8 (= 53) or 12 × 2 + 7 × 2 (= 38)) M1 (dep on at least M1) for "20 × 3" – "45" or "20 × 3" – "53" A1 cao [SC: B1 for an answer of 22 if M0 scored]
11	(a)		(1, 2)	1	B1 cao (accept coordinates just shown on the grid)
	(b)		(0, –3)	1	B1 cao (accept coordinates just shown on the grid)
	(c)		(3, –2)	1	B1 for (3, –2) or (–3, –4) or (–1, 6) [SC: B1 for coordinates reversed, (–2, 3) or (–4, –3) or (6, –1) if coordinates reversed in parts (a) **and** (b)]

PMT

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)(i)		19	2	B1 cao
	(ii)		Add 4		B1 for add 4 (+4) oe or $4n - 1$ (or $\times 4 - 1$)
	(b)	15 – 10 = 5 5×4 = 20	20	2	M1 for (15–10)×4 or 4 + 4 + 4 + 4 + 4 or 59, 39 or (4×15 – 1) – (4×10 – 1) or '59' – '39' from a list A1 cao
13	(a)		$3f$	1	B1 for $3f$ or $f3$ or $3 \times f$ or $f \times 3$
	(b)		$6m$	1	B1 for $6m$ or $m6$
	(c)		$4a + 5h$	2	B2 for $4a + 5h$ or $5h + 4a$ (B1 for $4a$ or $5h$ or $4a + 5h = 9ah$)
14	(a)		08 50	1	B1 for 08 50 or 8 50 (am) or 10 to 9
	(b)	13 43 – 13 29	14	1	B1 cao
	(c)*	e.g. HL to SC: 11 02 – 11 41 Visit (at least 3 hours) SC to HL: 15 16 – 15 49 [Note : there are 9 possible solutions]	A fully correct plan showing departure times and arrival times of the two bus journeys	4	B1 for a departure time of 08 02 or 09 04 or 10 12 or 11 02 from HL M1 (indep) for a correct arrival time at SC and a correct departure time from SC (or Cartbridge St) which allows for a stay of at least 3 hours in SC (the differencing does not have to be seen) OR for correctly adding 3 hours to a their arrival time at SC B1 for a departure time from SC of 13 20 (13 11 from CS) or 14 24 (14 14 from CS) or 15 16 (15 07 from CS) C1 (dep on M1) for a complete correct plan which includes the departure and arrival times of the two bus journeys [Note: bus departure times may be identified by their starting times. Eg the 15 07 from Cartbridge Street would be acceptable for the identification of the bus which arrives a HL at 15 49]

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		32	1	B1 cao
	(b)	e.g. $20 = £12.50 $100 = 5×£12.50 = £62.50 £62.50 – 60 = £2.50	£2.50 OR $4	3	M1 for a correct method to convert $100 to £, e.g. 5× '12.50' (= 62.50) ('12.50' is their reading from the graph at $20) M1 (dep) for '62.50' – 60 A1 for £2.5(0) (units must be stated) **OR** M1 for correct method to convert £60 to $, e.g. 3×32 (=96) or ft their answer to part (a) M1 (dep) for 100 – '96' A1 for $4 (units must be stated)
16	(a)	3×3×3×3	81	1	B1 cao
	(b)		4	1	B1 cao
17	(a)		7	1	B1 cao
	(b)		12	1	B1 cao
	(c)	$5w = 10 + 6$ $w = 16÷5$ or $w - \frac{6}{5} = \frac{10}{5}$ oe	16/5 oe	2	M1 for $5w-6+6 = 10 + 6$ oe or $w - \frac{6}{5} = \frac{10}{5}$ oe A1 for $\frac{16}{5}, 3\frac{1}{5}$, 3.2, oe

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)		21	1	B1 cao
	(b)		17	1	B1 cao
	(c)	55 – 15	40	2	M1 for 55 – 15 (accept 15 – 55 or 15 to 55 or 55 to 15 or 15, 55 but not 15 + 55) A1 cao
19*		360 – 200 – 90 (=70) (180 – '70') ÷2 angles at a point add to 360°, angles in a triangle add to 180°, base angles of an isosceles triangle are equal	y = 55 reasons	4	M1 for 360 – 200 – 90 oe M1 for (180 – '70') ÷ 2 Reasons: angles at a point add up to 360° angles in a triangle add up to 180° base angles of an isosceles triangle are equal C2 for y = 55° and all correct reasons Note: An answer of 55° alone, is not enough; y = 55° must be explicitly stated or clearly shown on the diagram (C1 for one correct reason) Note: the award of any C mark is dependant upon the award of at least M1

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
20		$\frac{1}{2} \times 60 = 30, 30 \times 5 = 150$ $\frac{1}{3} \times 60 = 20, 20 \times 4 = £80$ $3 \times 60 = 180$ $180 + 75 - 150 - 80 = £25$ 10 bags (i.e. 60 – 30 – 20) sold for 25 $25 \div 10 = 2.50$ OR $\frac{1}{2} \times 60 = 30, 30 \times £2 = £60$ profit $\frac{1}{3} \times 60 = 20, 20 \times £1 = £20$ profit $60 + 20 = £80$ $80 - 75 = 5$ loss on 10 bags (i.e. 60 – 30 – 20) $10 \times £3 = £30$ $30 - 5 = £25$ $£25 \div 10 = £2.50$	2.50	4	M1 for $\frac{1}{2} \times 60 \times 5$ (=150) or $\frac{1}{3} \times 60 \times 4$ (=80) M1 (dep on 1st M1) for $3 \times 60 + 75$ – '150' – '80' oe (=25) M1 (dep on previous M1) for '25'÷(60 – '30' – '20') A1 for 2.50 (accept 2.5) OR M1 for $\frac{1}{2} \times 60 \times 2$ (=60) or $\frac{1}{3} \times 60 \times 1$ (=20) M1 (dep on 1st M1) for (60 – '30' – '20') × 3 – ('60' + '20' – 75) oe (=25) M1 (dep on previous M1) for '25'÷(60 – '30' – '20') A1 for 2.50 (accept 2.5)

<table>
<tr><th colspan="5">1MA0_1F</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>21</td><td></td><td>e.g.
41 – 21 (=20)
49 – 10 – 20 (=19)
16 + 19 = 35

OR
(100 – 49) – (16 + 21) (=14)
14 + 10 (=24)
100 – (41 + 24) = 35

<table><tr><td></td><td>w</td><td>b</td><td>c</td><td></td></tr><tr><td>Boys</td><td>16</td><td>21</td><td>14</td><td>51</td></tr><tr><td>Girls</td><td>19</td><td>20</td><td>10</td><td>49</td></tr><tr><td></td><td>35</td><td>41</td><td>24</td><td>100</td></tr></table></td><td>35</td><td>4</td><td>M1 for 41 – 21 (= 20) or
M1 for 49 – 10 – ‘20’ (= 19)
M1 for 16 + ‘19’
A1 cao

OR
M1 for 100 – 49 (=51)
M1 for ‘51’ – 21 – 16 (= 14) and ‘14’ +10 (= 24)
M1 for 100 – (41 + ‘24’)
A1 cao

NB working may appear in table or diagram</td></tr>
<tr><td>22</td><td></td><td></td><td>4×6 rectangle</td><td>2</td><td>B2 for a single 4×6 rectangle drawn anywhere on the grid
(B1 for a single 4×n rectangle or a single m×6 rectangle drawn anywhere on the grid)

Note: All nets and 3-D sketches get NO marks</td></tr>
</table>

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
23		180×1.5 40×1.5 110×1.5 30×1.5	Flour = 270 Ginger = 60 Butter = 165 Sugar = 45	3	M1 for ×24÷16 oe or 24/16 or 1.5 seen or 180 + 90 (=270) or 40 + 20 (=60) or 110 + 55 (=165) or 30 + 15 (=45) or sight of any one of the correct answers A2 for all 4 correct answers (A1 for 2 or 3 correct answers)
24	(a) (b)		Positive (correlation) 83 to 87 inc.	1 2	B1 for positive (correlation) [do not accept a relationship] B2 for an answer in the range 83 to 87 inc. OR M1 for a single straight line segment with positive gradient that could be used as a line of best fit or for an indication on the diagram from 148 on the height axis A1 ft from their line of best fit
25		$\frac{9}{2}\times(12+18)=135$ 135 ÷ 20 = 6.75 (=7 bags) 7 × 4.99 OR $18\times9-\frac{1}{2}(6\times9)$ = 135 135 ÷ 20 = 6.75 (=7 bags) 7 × 4.99	34.93	4	M1 for $\frac{9}{2}\times(12+18)$ or $18\times9-\frac{1}{2}(6\times9)$ or $9\times12+\frac{1}{2}\times(18-12)\times9$ or 135 seen M1 (dep) for '135'÷ 20 or 6 or 7 seen M1 (dep on previous M1) for '6' × 4.99 or '7' × 4.99 A1 cao [SC: M1 for (12×9 + 6×9) ÷ 20 (= 162÷20) or 8 or 9 seen M1 (dep) for '8' × 4.99 or '9' × 4.99 OR M1 for (18×9 − 6×9) ÷ 20 (= 108÷20) or 5 or 6 seen M1 (dep) for '5' × 4.99 or '6' × 4.99]

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
26			Eg. How many hours do you read each day? 0 to 1 h ☐ over 1 h to 2 h ☐ over 2 h ☐	2	B1 for an appropriate question with reference to a time frame, with a unit of time, or a question with a time frame, with a unit of time, implied by responses B1 for at least 3 non-overlapping boxes (ignore if not exhaustive) or for at least 3 exhaustive boxes (ignore if any overlapping) [Note: labels on response boxes must not be inequalities] Do not accept frequency tables or data collection sheets for award of the second B mark
27		Area of cross section 4×7 + 5×2 or 9×2 + 5×4 **OR** 9 × 7 – 5 × 5 (= 38)	380	3	M1 for 4×7 + 5×2 (=38) or 9×2 + 5×4 (=38) or 7×9 − 5×5 (=38) or 4×7×10 or 5×2×10 (=100) or 9×2×10 (=180) or 5×4×10 (=200) or 9×7×10 (=630) or 5×5×10 (=250) M1 (dep) for '38'×10 or 380 or 4×7×10 + 5×2×10 or 9×2×10 + 5×4×10 or (7×9 − 5×5) ×10 A1 cao
28			Region shaded	3	B1 for circle arc of radius 3cm (± 2mm) centre Burford B1 for circle arc of radius 5 cm (± 2mm) centre Hightown B1 for overlapping regions of circle arcs shaded

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
29*		180÷9×1:180÷9×3:180÷9×5 =20:60:100 Not enough cement (but enough sand and enough gravel) OR 1×15:3×15:5×15 =15:45:75 15+45+75=135 (<180) Not enough cement (to make 180kg of concrete)	No + reason	4	M1 for 180 ÷ (1+3+5) (=20) or 3 multiples of 1: 3: 5 M1 for 1×'20' or 3×'20' or 5×'20' or 20 seen or 60 seen or 100 seen A1 for (Cement=) 20, (Sand=) 60, (Gravel=) 100 C1 ft (provided both Ms awarded) for not enough cement oe **OR** M1 for (1×15 and) 3×15 and 5×15 or 9×15 or sight of the numbers 15, 45, 75 together. M1 for '15' + '45' + '75' A1 for 135 (<180) C1 ft (provided both Ms awarded) for not enough cement oe

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
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If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
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Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		7025	1	B1 cao
	(b)		Nine thousand four hundred (and) fifty	1	B1 for Nine thousand four hundred (and) fifty Accept 'nine thousand' written as '9 thousand', 'four hundred' written as '4 hundred' and 'fifty' written as '5 tens' or any mixture of these. Do not penalise poor spelling.
	(c)		29	1	B1 for 29 or twenty nine or 29.0
	(d)		7000	1	B1 for 7000 or 7 thousand or seven thousand
2	(a)		8, 10	1	B1 cao
	(b)		24	1	B1 cao
	(c)		reason	1	B1 for a valid reason that demonstrates the understanding that the number of triangles is twice the pattern number
3	(a)		240	1	B1 for 240
	(b)		arrow at 125°C	1	B1 for arrow (or line) pointing within a range of 122.5 to 127.5 (ie nearer to 125 than either 120 or 130) Use professional judgement.
	(c)		6.05 (pm)	1	B1 for 6.05 (pm) oe

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)		Thursday	1	B1 cao
	(b)		7	1	B1 cao
	*(c)		Nick	3	M1 for the intention to add Dave's 4 times or Nick's 4 times A1 for 58 and 64 C1 (dep on M1 and two totals) for clearly stating Nick as their answer or ft from their two totals OR M1 for the intention to find the difference between the times on each of the 4 days A1 for 6 or −6 C1 (dep on M1 and a net difference) for clearly stating Nick as their answer or ft from their difference [SC: B1 for "Nick spent 6 minutes more than Dave on his phone" if M0 scored.]
5			9 squares shaded	1	B1 for any 9 squares shaded oe
6			66	2	M1 for a correct method to find the number of people on the bus if the 15 get off first. (= 57) A1 cao OR M1 for a correct method to find the number of people on the bus if the 9 get on first. (= 81) A1 cao OR M1 for a correct method to find the net change in the number of people on the bus (= 6 or −6) A1 cao

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
7		20 − 6.65 13.35 ÷ 3	4.45	3	M1 for a correct method to find the amount shared by B, R and T M1 (dep) for a correct method of dividing this amount by 3 A1 cao [SC: B1 for an answer of 17.78 (20 – 6.65 ÷ 3), if M0 scored, with or without working]
8	(a)		3, 6, 9, 3	3	B3 for a table showing all 4 correct frequencies in the correct place. (condone the absence of or any incorrect tallies) [(B2 for 2 or 3 correct tallies or 2 or 3 correct frequencies even in the wrong columns) (B1 for 1 correct tally or 1 correct frequency even in the wrong column)] [SC: B2 for 3/21 and 6/21 and 9/21 and 3/21 shown in the frequency column]
	(b)		3	1	B1 for 3 or ft table in (a)
9			Circle radius 5 cm drawn	1	B1 for a circle of radius 5 cm drawn (condone an alternative centre)

PMT

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(i)		5,15 or 5,125 or 15,125 or 30,50 or 30,60 or 30,90 or 30,100 or 50,60 or 50,90 or 50,100 or 60,90 or 60,100 or 90,100	4	B1 for 2 numbers, from the list, whose sum is an even number.
	(ii)		60 or 100		B1 for 60 or 100 or both
	(iii)		5 or 15		B1 for 5 or 15 or both
	(iv)		125		B1 cao
11		9.39 × 10 24.30 × 3 + 9.39 93.90 − 82.29	£11.61	5	M1 for a correct method to find the most expensive way to buy the 10 cartridges (= 93.90) M1 for a correct method to find the least expensive way to buy the 10 cartridges (= 82.29) M1 (dep on M1 scored) for a correct method to find the difference between their least and their most expensive way, provided that both totals are for the cost of exactly 10 cartridges A1 for 11.61 B1 (indep) for correct units

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)(i)		B and D	2	B1 cao
	(ii)		G and E		B1 for G and E (allow B and D if not in (i))
	(b)	3 + 3 + 3 + 2 + 2 +1 + 1 + 1	16	1	B1 cao
13	(a)		6am	1	B1 for 6am (accept −4) Do not accept 6 alone.
	(b)		3	1	B1 for 3 (allow − 3)
	(c)	−1−5	−6	2	M1 for −1 − 5 or intention to subtract 5 from -1 (may be shown on a diagram) A1 cao

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*14			Yes + supporting work	4	M1 for adding the weights of all the ingredients (= 96) M1 (dep) for '96' × 8 A1 cao for 768 C1 (dep on M2), ft for a correct conclusion (yes or no) from a comparison of 750 (pots) with their '768' pots; units must be quoted [SC: B1 for 768 seen without working if M0M0 scored] **OR** M1 for adding the weights of all the ingredients (= 96) M1 for 750 ÷ 8 A1 cao for 93.75 C1(dep on M2), ft for a correct conclusion (yes or no) from a comparison of their weight of ingredients in one tank full '93.75' kg with '96' kg; units must be quoted [SC: B1 for 93.75 seen without working if M0M0 scored]] **OR** M1 for adding the weights of all the ingredients (= 96) M1 (dep) for 750 ÷ '96' A1 cao for 7.8125 C1(dep on M2), ft for a correct conclusion (yes or no) from a comparison of their number of pots, '7.8125' pots with 8 (pots); units must be quoted [SC: B1 for 7.8125 seen without working if M0M0 scored]]
15			85 29 54 **168** **93** 31 47 171 13 5 **9** **27** 191 **65** **110** 366	3	B3 for fully correct table (B2 for 3 or 4 or 5 correct entries, B1 for 1 or 2 correct entries)

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)(i)		5	3	B1 cao
	(ii)		8		B1 cao
	(iii)		5		B1 cao
	(b)		correct sketch	2	B2 for fully correct sketch [B1 for a square (or rectangle) drawn with 2 or 3 connecting triangles on the outside of the square]
17	(a)(i)		12.978(61279…)	2	B1 for 12.978(…..)
	(ii)		13		B1 for 13 or ft from a(i) [Note: An answer of 13.0 gets B0]
	(b)		100000	1	B1 cao
18	(a)	$2 \times 8 = 16$ $16 + 7$	23	2	M1 for correct substitution of 8 into the expression $2f$ A1 cao
	(b)	$3 \times -2 + 5 \times 4$	14	2	M1 for correct substitution into the formula A1 cao

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)		$\frac{40}{360}$	1	B1 for $\frac{40}{360}$ oe (ignore any incorrect simplification) Accept 0.11…. if no fraction shown
	(b)		4	3	M1 for a correct method to find the angle of the 'weeding' sector If measured, accept an angle between 138 and 142 inc. M1 (dep) for a correct method to find the number of degrees per hour (= 20) or the number of hours ($\frac{1}{20}$ (3 mins) per degree A1 cao for 4
20	(a)		2.5	2	M1 for 10 (cm) or "10" ÷ 4 A1 for 2.45 – 2.55
	(b)		A marked on diagram	2	M1 for a point marked (or line drawn) on a bearing of 038° from either point B or point W, OR for a point marked (or arc drawn) 6 cm from B A1 for the position of Avebury marked (accept without label if not ambiguous)

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
21	(a)		30	1	B1 for 30 minutes oe
	(b)		20	1	B1 cao
	(c)		graph completed	2	B1 for horizontal line from (5, 20) to (5.30, 20) B1 for a single straight line with the correct gradient from '(5.30, 20)' to the time axis
22	(a)		$x = 3$ drawn	1	B1 for $x = 3$ drawn [Note: each line drawn must be a single line segment satisfying $x = 3$]
	(b)		$y = x$ drawn	1	B1 for $y = x$ drawn [Note: each line drawn must be a single line segment satisfying $y = x$]
	(c)	Gradient = $\frac{3-0}{0--2}$	1.5	2	M1 for a method to find the gradient of the given line A1 for 1.5 oe
23	(a)		n^8	1	B1 for n^8 (accept n^{5+3})
	(b)		n^5	1	B1 for n^5 (accept n^{7-2})

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
24	(a)	15 ÷ 6	2.5	2	M1 for 15 ÷ 6 oe A1 for 2.5 or $2\frac{1}{2}$
	*(b)		Yes + evidence	2	M1 for a correct method to change 15 miles into kilometres C1(dep on M1) for 24 km **and** statement with correct conclusion [SC: B1 for "Yes" oe and 24 km shown if M0 scored] **OR** M1 for a correct method to change 20 kilometres into miles C1(dep on M1) for 12.5 miles **and** statement with correct conclusion [SC: B1 for "Yes" oe and 12.5 miles shown if M0 scored]

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
25			414.96	5	M1 for a correct method to work out the amount of oil required to fill the tank M1 for a correct method to find the cost of oil required before the discount M1 for a correct method of finding 5% of their calculated cost M1 (dep on previous M1) for a correct method to find the discounted cost A1 for correct answer of 414.96 or 41496p **OR** M1 for a correct method of finding 5% of the cost of 1 litre of oil M1 (dep on previous M1) for a correct method to find the discounted cost of 1 litre of oil M1 for a correct method to work out the amount of oil required to fill the tank M1 for a correct method to find the discounted cost of the oil required A1 for correct answer of 414.96 or 41496p **OR** M1 for a correct method to work out the amount of oil required to fill the tank M1 for a correct method of finding 5% of their calculated amount of oil M1 (dep on previous M1) for a correct method to find the reduced amount of oil M1 for a correct method to find the cost of the reduced amount of oil A1 for correct answer of 414.96 or 41496p

1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
26	(a)	$1 - 0.2 - 0.1$ $0.7 \div 2$	0.35	3	M1 for correctly using total probability 1 or 100% if percentages used M1 (dep) for complete correct method to complete the solution A1 for 0.35 or 35% or $\frac{35}{100}$ oe
	(b)	0.1×200	20	2	M1 for 0.1×200 A1 cao [SC: B1 for an answer of $\frac{20}{200}$ if M0 scored]
27	(a)		$3x + 12$	1	B1 for $3x + 12$ or $12 + 3x$
	(b)		$x^3 + 2x$	2	M1 for the intention to multiply both terms in the bracket by x A1 for $x^3 + 2x$ OR B2 for $x^3 + 2x$ [B1 for x^3 or $2x$ seen]
	(c)		$x(x - 6)$	1	B1 for $x(x - 6)$ or $(x - 6)x$

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1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
28			1180	3	M1 for a correct method to find the area of the cross section M1 (dep) for a complete correct method for the volume of the prism A1 cao OR M1 for a correct method to find the volume of one cuboid M1 (dep) for a complete correct method for the volume of the prism A1 cao

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations
Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers
Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

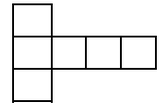
PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		2085	1	B1 for 2085 or 2,085
	(b)		five thousand, one hundred and eight	1	B1 for five thousand, one hundred (and) eight
	(c)		9 tenths		B1 for 9 tenths oe, eg $\frac{9}{10}$ or $\frac{90}{100}$
	(d)		160	1	B1 cao
2			inches grams litres	3	B1 for inch(es) or ins B1 for gram(s) or g B1 for litre(s) or *l* or millilitre(s) or m*l* (accept centilitres or cc or c*l* or cm^3)
3	(a)(i)		right angle marked	1	B1 for a clear intention to mark bottom left hand angle with R (accept r)or right-angle marked
	(ii)		acute	1	B1 for acute
	(iii)		reflex	1	B1 for reflex
	(b)		perpendicular line from *T* to *AB*	1	B1 for perpendicular line from *T* to *AB* (within guidelines of overlay)
4	(a)		5*m*	1	B1 for 5*m* or 5×*m* or *m*×5 or *m*5
	(b)		9*p*	1	B1 for 9*p* or *p*9
	(c)		4*tw*	1	B1 for 4*tw* or 4*wt* or *tw*4 or *wt*4 (condone 4×*tw* and 4×*wt*)

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
5			$\frac{40}{200}$	3	**(uses frequencies)** M1 for 40 or 200 or any correct day total M1 for $\frac{40}{T}$, $T > 40$ or $\frac{n}{200}$, $n < 200$ A1 for $\frac{40}{200}$ oe accept 20% OR **(uses boxes)** M1 for 2 or 10 M1 for $\frac{2}{T}$, $T > 2$ or $\frac{n}{10}$, $n < 10$ A1 for $\frac{2}{10}$ oe accept 20% OR **(uses rectangles)** M1 for 8 or 40 M1 for $\frac{8}{T}$, $T > 8$ or $\frac{n}{40}$, $n < 40$ A1 for $\frac{8}{40}$ oe accept 20% [SC B2 for 40 out of 200 oe]
6	(a)		circle drawn, centre *O* radius *OP*	1	B1 for circle drawn radius *OP* within guidelines of overlay
	(b)		chord drawn	1	B1 for any line drawn joining two points on circumference of circle (accept diameter) [NB shaded segment scores B0]

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
7			110	2	M1 for 30 + 70 + 20 (=120) or 50 + 40 + 20 (=110) or 50 + 10 + 60 (=120) A1 cao
8	(a)	4 × 3	12	1	B1 cao
	(b)		5	2	M1 for 4 × 2 – 3 A1 cao
9			5%	2	**(uses percentages)** M1 for 30 – 25 (= 5) or 25 – 30 (= −5) A1 for 5% oe OR **(uses decimals)** M1 for or 0.3 – 0.25 or 0.25 – 0.3 (= −0.05) A1 for 0.05 OR **(uses fractions)** M1 for $\frac{30}{100} - \frac{1}{4}$ or $\frac{1}{4} - \frac{30}{100}$ $(=-\frac{5}{100})$ A1 for $\frac{5}{100}$ oe OR **(uses trial value, eg 60)** M1 for 0.3×60 – 0.25×60 (=3) or 0.25×60 – 0.3×60 (= −3) A1 for $\frac{3}{60}$ oe
*10			diagram or chart	4	B1 for a key or suitable labels to identify Kitty and George B1 for diagram(s) or chart(s) set up for comparison, showing data for at least 3 months, eg dual bar chart, line graph etc B1 for correct heights for Kitty **or** George, dependent on a linear scale C1 for a fully correct diagram or chart to include 4 months labelled and eg 'cars' or 'frequency' axis correctly scaled and labelled

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		12	1	B1 cao
	(b)		14	1	B1 cao
	(c)		16	1	B1 cao
12	(i)	2 2 3 3 3 4 4 5 5 6 (▲ under 4)	3.5	6	M1 for ordering the data condone one extra or one omission A1 for 3.5 or $3\frac{1}{2}$
	(ii)		4		M1 for 6 – 2 or 2 – 6 A1 cao
	(iii)		3.7		M1 for (2+2+3+3+3+4+4+5+5+6) ÷ 10 condone missing brackets or 37÷10 A1 for 3.7 or $3\frac{7}{10}$ [SC B1 for 31.6 or 33.4]
13			60	3	M1 for 9 × 14 + 6 (=132) M1 (dep) for full method to convert '132' from lbs to kg using the graph **or** for '132'÷2.2 (=60) A1 for 59 – 62 OR M1 for reading off 14 lbs (= 6.2–6.5) and 6 lbs (=2.4–2.9) M1 (dep) for 9 × '6.4' + '2.75' A1 for 59 – 62 [SC B2 for 66]

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*14			Correct statement	4	M1 for 6.50 × 8 + 12 or 6.50 × 7 + 15 M1 for 6.50 × 8 + 12 and 6.50 × 7 + 15 A1 for 64 and 60.5(0) C1 (dep on first M1) for correct statement ft their figures OR M1 for 6.50 × (8−7) or 15−12 M1 for 6.50 × (8−7) and 15−12 A1 for 6.5(0) and 3 C1 (dep on first M1) for correct statement ft their figures [SC If no working shown B1 for 64 and 60.5(0) **or** B1 for 6.5(0) and 3]
15			coin / tally / freq £1 / lll / 3 50p / / (0) 20p / ~~llll~~1 / 6 10p / lll / 3 5p / ll / 2 2p / / (0) 1p / ll / 2	2	B2 for all frequencies correct condone missing 0s (B1 for at least 3 correct non zero frequencies or at least 3 correct non zero tallies or at least 2 correct non zero tallies with their frequencies correct)

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)		8	1	B1 cao
	(b)			2	M1 for 5 or 6 squares drawn and joined A1 for a correct net [NB missing internal lines may be implied by grid]
	(c)		54	2	M1 for 3 × 3 × 6 oe A1 cao
17	(a)		720	2	M1 for 6 × 120 or 600 × 120 ÷ 100 oe A1 for 720 oe (accept 720.0)
	(b)		£10 or €12	3	M1 for 540÷1.2 (=450) oe, eg 4×100+50 (=450) M1(dep) for 460 – '450' (=10) A1 for £10 oe (accept £10.0) OR M1 for 460×1.2 (=552) oe, eg 4×120+60+12 (=552) M1 (dep) for '552' – 540 (=12) A1 for €12 oe (accept €12.0)
18			11	3	M1 for $52 \times \frac{3}{4}$ (=39) oe or $\frac{120}{360} \times 150$ (=50) oe M1 for $52 \times \frac{3}{4}$ (=39) oe and $\frac{120}{360} \times 150$ (=50) oe A1 cao

PAPER: 1MA0_2F					
Question		Working	Answer	Mark	Notes
19	(a)		40	3	M1 for 120 × 100 (=12 000) or 20 × 15 (=300) M1 (dep) for '12 000' ÷ '300' A1 cao OR M1 for 120 ÷ 15 (= 8) or 100 ÷ 20 (= 5) M1 (dep) for '8' × '5' A1 cao OR M1 for 120 ÷ 20 (=6) or 100 ÷ 15 (=6.66…) M1 (dep) for '6'×'6.66…' (=40) or '6'×'6' (=36) or '6'×'7' (=42) A1 cao
	(b)		10.40	2	M1 for $\frac{20}{100}$ × 52 oe A1 for 10.4(0) [SC B1 for 62.4(0) or 41.6(0)]

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*20		**(Method 1)** Angle *ACB* = 180 – 135 (= 45) (sum of angles on a straight line = 180) Angle *ABC* = 180 – 70 – 45 (=65) (sum of angles in a triangle = 180 (*x* =) 180 – 65 (=115) (sum of angles on a straight line = 180) OR **(Method 2)** Angle *ACB* = 180 – 135 (= 45) (sum of angles on a straight line = 180) (*x* =) 70 + 45 (=115) (exterior angle = sum of interior opposite angles) OR **(Method 3)** Angle DAB = 180 – 70 = 110 (sum of angles on a straight line = 180) (*x* =) 360 – 135 – 110 (sum of exterior angles of a polygon = 360)	*x* = 115	5	M1 for correct method to find angle *DAB* or angle *ACB* or angle *ABC* (may be implied by correct angle marked in diagram) M1 for complete correct method to find *x* A1 for *x* = 115 C2 (dep on M1) for fully correct reasons for chosen method no extras (C1 (dep on M1) for one correct reason for chosen method) [NB *x* = 115 must be stated explicitly, 115 only scores A0]

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PAPER: 1MA0_2F					
Question		Working	Answer	Mark	Notes
21	(a)		2.70	3	M1 for 2 × 1.40 + 2.10 + 2.40 (= 7.30) M1 (dep) for 10 – '7.30' or 2.7(0) A1 for 2.70 in correct money notation OR M1 for subtracting at least 2 different correct costs from (£)10 M1 for 10 – 1.40 – 1.40 – 2.10 – 2.40 A1 for 2.70 in correct money notation [SC B1 for 4.10 in correct money notation]
	(b)		2.21	3	M1 for 2.60×0.15 (= 0.39) or 260×0.15 (=39p) M1 (dep) for 2.60 – '0.39' or 260–39 (=221p) A1 cao OR M1 for 1 – 0.15 (=0.85) or 100 – 15 (=85) M1 (dep) for 2.60 × 0.85 oe A1 cao

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*22			Not enough mincemeat since 600<700 OR Only able to make 38 mince pies since insufficient mincemeat	4	M1 for 45 ÷ 18 (= 2.5) M1 for 2.5 used as factor or divisor A1 for 562.5 and 875 and 250 and 700 and 2.5 (accept 2 or 3) OR for availables as 400 and 400 and 200 and 240 and 2.4 (accept 2 or 3) C1 ft (dep on at least M1) for identifying and stating which ingredient is insufficient for the recipe (with some supportive evidence) OR M1 for a correct method to determine the number of pies one ingredient could produce M1 for a correct method to determine the number of pies **all** ingredient could produce A1 for 80 and 51 and 90 and 38 and 108 C1 ft (dep on at least M1) for identifying and stating which ingredient is insufficient for the recipe (with some supportive evidence)
23	(a)		Response boxes overlap and are not exhaustive	2	B2 for **TWO** aspects from: No time frame given Non-exhaustive responses Response boxes over-lapping (B1 for ONE correct aspect)
	(b)		How many magazines do you buy each month? 0-4 5-8 over 8	2	B1 for a question with a time frame B1 for at least 3 correctly labelled response boxes (non-overlapping, need not be exhaustive) **or** for a set of response boxes that are exhaustive (could be overlapping) [NB do not allow inequalities in response boxes]
	(c)		One reason	1	B1 for one reason eg all the same age, may all be males, may all like same types of magazines, sample too small, biased

PAPER: 1MA0_2F

Question	Working	Answer	Mark	Notes
24	x | $x^3 + 2x$ 4 | 72 4.1 | 77.(121) 4.2 | 82.(488) 4.3 | 88.(107) 4.4 | 93.(984) 4.5 | 100.(125) 4.6 | 106.(536) 4.7 | 113.(223) 4.8 | 120.(192) 4.9 | 127.(449) 5 | 135 | 4.65 | 109.8(44625) 4.66 | 110.5(14696) 4.67 | 111.1(87563) 4.68 | 111.8(63232) 4.69 | 112.5(41709)	4.7	4	B2 for a trial $4.6 \leq x \leq 4.7$ evaluated correctly (B1 for a trial evaluated correctly for $4 \leq x \leq 5$) B1 for a different trial evaluated correctly for $4.65 \leq x < 4.7$ B1 (dep on at least one previous B1) for 4.7 [Note: Trials should be evaluated to at least accuracy shown in table, truncated or rounded] [NB No working scores 0 marks]

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PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
25			28% or $\frac{14}{50}$	4	M1 for 100 − 30 (=70) or $1-\frac{3}{10}(=\frac{7}{10})$ M1 for '+70' ÷ (3 + 2) (=14) or '$\frac{7}{10}$' ÷ (3 + 2)(= $\frac{7}{50}$) M1 for '14' × 2 or $\frac{7}{50}\times 2$ A1 for 28% or $\frac{14}{50}$ oe OR M1 for a correct method to find (100−30)% of any actual sum of money, eg 0.7×500 M1 for '350' ÷ (3 + 2) (=70) M1 for '70' × 2 (=140) A1 for 28% or $\frac{14}{50}$ oe OR M1 for starting with a two numbers in ratio 3:2, eg 21 and 14 M1 for equating sum of their numbers to 100 – 30 (=70), eg '21' + '14' (=35) M1 for scaling sum of their numbers to 100%, eg '35'÷70×100 (=50) A1 for 28% or $\frac{14}{50}$ oe [SC award B3 for oe answers expressed in an incorrect form eg $\frac{2.8}{10}$]
26		$3x - 6 = x + 7$ $2x = 13$	6.5	3	M1 for $3\times x - 3\times 2$ (=$3x$ – 6) or $\frac{x}{3}+\frac{7}{3}$ seen M1 for correct method to isolate the terms in x or the number terms on opposite sides of an equation A1 for 6.5 oe
27			3.52	3	M1 for $1.35^2 + 3.25^2$ M1 (dep) for $\sqrt{(1.35^2 + 3.25^2)}$ (=$\sqrt{12.385}$) A1 for answer in the range 3.51 to 3.52

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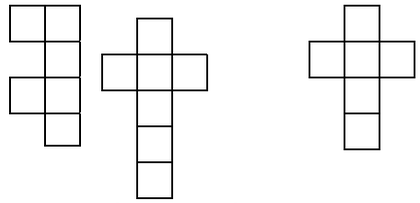
Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
2		MLP: candidates told that there are three spaces to fill. Braille: table shows: (i) centimetres (ii) ounces (iii) pints and candidates have been asked to write down what is missing.	Standard mark scheme Standard mark scheme
3	(a)	size of diagram is ×1.5	Standard mark scheme
	(b)	Line AB is 10 cm and T is 5 cm away from the line.	Standard mark scheme
6	(a)	OP = 5 cm and is a horizontal line.	B1 for circle drawn radius 4.5 to 5.5 cm
	(b)	circle size is increased by 1.5	Standard mark scheme
8	(a)	a is changed to e and b to f.	Standard mark scheme
10		1.5 cm grid.	B1 for intention to draw correct heights for Kitty **or** George, dependent on a linear scale

PMT

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
13		*x*-axis:1.5 cm for $\frac{1}{2}$ *y*-axis: 1.5 cm for 2 Leeway will be needed in marking answers.	Standard mark scheme
16	(a)	Models as well as diagrams provided.	Standard mark scheme
	(b)	Question changed, now reads: Look at the diagrams for Question 16(b). Which diagram, Shape 1, Shape 2 or Shape 3 is the net of a cube?'  Shape 1 shape2 shape3	B2 for diagram 3
	(c)	models as well as diagrams provided.	Standard mark scheme
20		Wording added: 'Angle FCA = 135^0 Angle CAB = 70^0	Standard mark scheme
26		MLP only: *x* is changed to *y*.	Standard mark scheme
27		Braille only. Wording added: '*XY* = 1.35 metres. *YZ* = 3.25 metres.'	Standard mark scheme

PMT

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Mark Scheme (Results)

November 2013

Pearson Edexcel GCSE
In Mathematics Modular (2MB01)
Unit 1: (5MB1F_01) Foundation (Calculator)

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NOTES ON MARKING PRINCIPLES

1 All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

2 Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labeling conventions.

ii) *select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate.*
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

7 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

9 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

11 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

Guidance on the use of codes within this mark scheme
M1 – method mark A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

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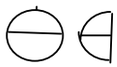
PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		24	1	B1 cao
	(b)		22	2	M1 for 8 + 8 + 6 oe or "24" − 2 A1 cao
	(c)			1	B1 for drawing a circle showing 4 quadrants and a semicircle showing 2 sectors
2	(a)		evens	1	B1 cao
	(b)		unlikely	1	B1 cao
	(c)		1 marked	1	B1 for cross marked at 1
	(d)		colours	1	B1 for 2 or 3 additional counters marked red
*3	(a)		diagram or chart	4	B1 for a key or suitable labels to identify Harry and Shamus B1 for horizontal or vertical axis labelled B1 for at least 3 correct plots C1 for fully correct diagram(s) or charts(s)
	(b)		comparisons	2	B1, B1 ft for any two correct comparisons.

$\frac{1}{4}$

PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
4			7.31	4	M1 for a correct method to work out the total cost (= 16.92) M1 for a correct method to find $\frac{1}{4}$ of their total cost (or $\frac{3}{4}$) M1 (dep on at least M1) for subtraction from £20 A1 cao
5	(a)		2	2	M1 for attempt to order or two middle unordered numbers selected A1 cao
	(b)		4	2	M1 for 5 – 1 or 1 – 5 or 1 to 5 A1 cao
	(c)		18 11 7 3 1	1	B1 cao
	(d)		40	1	B1 for 40 or ft their frequencies
	(e)	18×0 + 11×1 + 7×2 + 3×3 + 1×4 =	38	2	M1 for Σ *fx* A1 cao [SC: no working- B1 for 56]
*6			No	2	M1 for a relevant calculation, eg 60 +30 or 95 ÷ 60 (= 1.58…) or sight of 90 C1 (dep on M1) for correct statement with correct calculations
7	(a)		(A1), A2, A3 B1, B2, B3 C1,C2 C3	2	B2 for a fully correct list (B1 for 5 or 6 more correct. Ignore repeats)
	(b)		$\frac{1}{9}$	1	B1 for $\frac{1}{9}$ oe or ft part (a)

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PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		$\frac{1}{4}$	1	B1 for $\frac{1}{4}$ oe
	(b)		$2x°$	1	B1 for $2x°$ oe (condone omission of °)
	(c)		20	2	M1 for 150 ÷ 360 × 48 oe or 48 ÷ 4 + $\frac{2}{3}$ × (48 ÷ 4) oe A1 cao
*9			Investment B	4	M1 for 3×12×5 (= 180) M1 for 2500 × 3 × 2.5 ÷ 100 (= £187.50) A1 for (£)180 and (£)187.5(0) or (£)2680 and (£)2687.5(0) C1 (dep on M2) for correct conclusion for their figures Alternative method: M1 for 12 × 5 = 60 M1 for '60'÷ 2500 × 100 A1 for 2.4(%) C1 (dep on M2) for correct conclusion for their figures NB: accept comparable figures for different time periods SC: If compound interest used can score M1 M0 A0 C1 ft

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PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)	<table><tr><td>4</td><td>**15**</td><td>**11**</td><td>**30**</td></tr><tr><td>**12**</td><td>5</td><td>**10**</td><td>27</td></tr><tr><td>**16**</td><td>20</td><td>21</td><td>57</td></tr></table>	complete 2-way table	3	B3 cao (B2 for 4 or 5 correct entries B1 for 2 or 3 correct entries)
	(b)		5	1	B1 cao
	(c)		19	1	B1 for 19 or ft 4 + “15” or 30 – “11”
11	(a)		question + response boxes	2	B1 for appropriate question with time period B1 for at least 3 boxes that are either non-overlapping but not necessarily exhaustive, or exhaustive but not necessarily non-overlapping NB time period and/or unit of time may appear in either the question or with the response boxes; award a maximum of B1 if no units
	(b)		two correct reasons	2	B2 for 2 correct reasons from, eg only girls, (all about) the same age, same year group, same school (B1 for 1 correct reason)
12	(a)		$0.75 - x$	2	M1 for $1 - 0.25 + x$ or $0.25 + x$ A1 or $0.75 - x$ oe
	(b)		60	2	M1 for 0.25×240 oe A1 cao

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PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)		Positive correlation	1	B1 for positive correlation or the greater the rainfall the more umbrellas sold oe
	(b)		52 – 58	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or an indication on the diagram from 28 on the *x*-axis A1 for an answer in the range of 52 – 58
*14		2 × 462 + 251 = 1175 0.95×1175 = 1116.25 2 × 485 + 218 = 1188 1188 – 75 = 1113.00	Jetstream	5	M1for identifying correct costs for either Highway Airlines or Jetstream Airlines M1 for attempt to calculate the costs for the family eg 2× “462” “251” or 2 × “485” + “218” M1 for a correct method to work out the discount for one company eg 0.95 × “1175” or 0.05 × “1175” or “1188” – 75 A1 for (£)1116.25 and (£)1113.00 C1 (dep on M1) for calculations clearly identified with each airline and correct decision from their figures

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Measurements of length: ±5 mm

PAPER:			
Question		**Modification**	**Notes**
Q1		Circles are 2.5cm diameter. Key at top of pictogram.	Standard mark scheme
Q2	(c)	Probability scale is 16cm long.	Standard mark scheme
Q3		Grid is 2cm squares.	Standard mark scheme
Q4		No pictures just information given.	Standard mark scheme
Q10		Braille table has (i) to (vi) in spaces. 4 (i) (vi) (ii) (iv) 5 (v) 27 (iii) 2 21 57	Standard mark scheme
Q13		*x* axis 2cm for 5. *y* axis 2cm for 10. *x* changed to filled in circles. Right axis labelled.	Standard mark scheme
	(b)	Rainfall changed from 28mm to 30mm.	Standard mark scheme
Q14		On both tables top 2 rows and bottom 2 rows removed.	Standard mark scheme

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Mark Scheme (Results)

November 2014

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Foundation (Calculator) Unit 1

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NOTES ON MARKING PRINCIPLES

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3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Note that in some cases a correct answer alone will not score marks unless supported by working; these situations are made clear in the mark scheme. Examiners should be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will award marks for the quality of written communication (QWC).
The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labelling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Partial answers shown (usually indicated in the ms by brackets) can be awarded the method mark associated with it (implied).
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks; transcription errors may also gain some credit. Send any such responses to review for the Team Leader to consider.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
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It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect cancelling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

10 Probability

Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

PMT

Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

12 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

14 The detailed notes in the mark scheme, and in practice/training material for examiners, should be taken as precedents over the above notes.

Guidance on the use of codes within this mark scheme
M1 – method mark for appropriate method in the context of the question A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

PMT

PAPER: 5MB1F_01					
Question		Working	Answer	Mark	Notes
1.	(a)		20	1	B1 cao
	(b)		14	1	B1 cao
	(c)		2 squares	2	B1 for 2 squares
			$4\frac{1}{2}$ squares		B1 for $4\frac{1}{2}$ squares
2.	(a)		8	1	B1 cao
	(b)	6+5+8+6+7+7+8 +8+8+6 = 69 69÷10	6.9	2	M1 for complete correct method to find mean e.g. sum ÷ 10 A1 for 6.9
	(c)		3	2	M1 for 8 − 5 or 5 − 8 or −3 A1 cao
	(d)		No with reason	1	B1 for No and reason e.g. 7 is between highest and lowest
3.	(a)		Reed Farm	1	B1 cao
	(b)		Rosewood	1	B1 cao
	(c)		£545	1	B1 cao

PAPER: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
4.		£4.45	3	M1 for adding 3 different prices (e.g. 3.00 + 3.50 + 2.95 (= 9.45)) or selecting the 3 highest prices M1 for complete method to find difference between total of 3 highest normal prices and £5 A1 cao
*5.		Diagram or chart	4	M1 for key or suitable labels to identify max and min M1 for 5 correct day labels or a linear scale M1 for diagram or chart (combined or separate) set up for comparison, correctly showing data for at least 3 days C1 for fully correct diagram or chart with axes correctly scaled and labelled
6. (a)		1418	1	B1 cao
(b)		Correct plan showing departure times and arrival times for 2 train journeys.	4	B1 for a departure time from Cromer of 10 57, 11 57 or 12 57 M1 for an arrival time at Norwich which is no later than 13 41 M1 for adding 30 minutes to 16 55 or correct departure time. A1 all train departure and arrival times correct (10 57 and 11 41 or 11 57 and 12 41 or 12 57 and 13 41 AND 17 45 (and 18 36))
7. (a)		Cross at $\frac{3}{10}$	1	B1 for cross at $\frac{3}{10}$
(b)		Cross at 0	1	B1 for cross at 0
(c)		I	1	B1 cao
8.		3	2	M1 for working out or using a correct duration of time. A1 cao

PAPER: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
9.		Correct pairs 3,7 or 4,6 or 2,8 or 5,5	2	B2 for 2 pairs from 5,5 or 3,7 or 4,6 or 2,8 (B1 for one pair) (Note: Condone non-integers if correct pair(s) given)
*10		London is more expensive	4	M1 for reading from the graph, e.g. £10 = €12 or €7 = £5.80 M1 for a complete method to convert either £60 into € or €70 into £ A1 for answer in interval €71 to €72 or in interval £57 to £59 C1 ft (dep on M1) for correct conclusion for their figures using consistent units
11.		165	3	M1 for correct method to find 5% of 300 or $\frac{2}{5}$ of 300 M1 (dep) for 300 – "15" – "120" A1 cao OR M1 for 1 – 0.05 – 0.4 (= 0.55) M1 (dep) for "0.55" × 300 A1 cao

PMT

PAPER: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
12. (a)		22	1	B1 cao
(b)		23	3	M1 for correct method to find total women who came by bus, e.g. 13 – 6 (=7) M1 for correct method to find women who came by train, e.g. 22 – 7 – 4 (=11) A1 cao OR M1 for correct method to find men who came by car, e.g. 28 – 6 – 12 (= 10) M1 for correct method to find total who came by car, e.g. 10 + 4 (= 14) A1 cao
(c)		$\frac{3}{7}$	2	M1 for $\frac{12}{28}$ oe A1 oe
13.		30	2	M1 for 0.6 × 50 oe A1 cao
14.		$\frac{x+x+5+2x}{3}$	2	M1 for intention to add x, $x + 5$, $2x$ or $4x + 5$ seen or ambiguous answer, e.g. "$4x + 5$" ÷ 3 A1 for $\frac{x+x+5+2x}{3}$ oe

PAPER: 5MB1F_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
15. (a)		2 different reasons	2	B1 for a reason relating to: Bias – due to gender or due to railway station location Size of sample too small B1 for one other reason
(b)		Question and response boxes	2	B1 for a suitable question with time period and units in question or response boxes B1 for at least 3 non-overlapping and exhaustive response boxes
16.		12 | 3 5 9 13 | 0 3 3 5 7 8 14 | 7 7 8 9 15 | 0 1	3	B2 for a fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most two errors) B1 for correct key eg 12 | 3 means 123 (cm)
17. (a)		Point at (47, 34)	1	B1 point plotted
(b)		Positive	1	Positive (correlation)
(c)		48 to 51 inclusive	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or a horizontal line from 35 or point marked at (n, 35) A1 for given answer in the range 48 – 51

Modifications to the mark scheme for Modified Large Print (MLP) papers.

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The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm

PAPER: 5MB1F_01			
Question		**Modification**	**Notes**
1		Key top left. Pictures size x 2½	
3		Table: Location column removed	
5		Table: Friday row removed, Saturday – 17 changed to 12 Grid: Vertical axis – 15 x 2 cm squares, horizontal axis 10 x 2 cm squares Room left for labelling on the left and below.	
6		Table: North Walsham now removed from both tables. 1057 and 1557 removed from Cromer to Norwich 1445 and 1955 removed from Norwich to Cromer	
7		Probability scales lengthened	
10		1½ cm grid. Inside measurements of squares are 1.4 cm. Right axis labelled	

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PAPER: 5MB3H_01			
Question		**Modification**	**Notes**
12		Braille: (i) is put in total women and (ii) in train total	
16		Diagram enlarged. 4th horizontal line drawn in at the bottom.	
17		1½cm grid. Inside measurements of squares are 1.4 cm. Crosses changed to filled in circles. Right axis labelled	

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Mark Scheme (Results)

November 2014

Pearson Edexcel GCSE
In Mathematics A (1MA0)
Foundation (Non-Calculator) Paper 1F

PMT

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The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labelling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

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If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
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Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

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It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect cancelling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

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Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
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Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

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Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

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Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

14 The detailed notes in the mark scheme, and in practice/training material for examiners, should be taken as precedents over the above notes.

Guidance on the use of codes within this mark scheme
M1 – method mark for appropriate method in the context of the question A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		Lhotse	1	B1 cao
	(b)		8200	1	B1 cao
	(c)		Seven thousand four hundred and twenty-eight	1	B1 for any unambiguous answer
	(d)		8051	1	B1 cao
2	(a)		4,8,3,3,2	2	M1 for at least 2 tallies or 2 frequencies correct A1 for 5 correct frequencies
	(b)		correct graph	3	M1 for bar chart or other suitable chart with at least 2 correct frequencies drawn for their scale (ft from (a)) M1 for all bars labelled and vertical axis correctly scaled A1 for accurately representing their data, with all labels, ft from (a)
3	(a)		56 000	1	B1 cao
	(b)		276	1	B1 cao
	(c)		6	1	B1 cao
	(d)		29	1	B1 cao
	(e)		13	1	B1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
4			3	3	M1 for attempt to find number of bags needed eg 254 ÷ 20 oe (= 12.7) **or**12 **or** 13 M1 (dep) for "254 ÷ 20" ÷ 5 oe (= 2.4) A1 cao **OR** M1 for 5 × 20 (=100) M1 (dep) for intention to find how many "100" in 254 (= 2.54) A1 cao
5	(a)		B or C	1	B1 for B **or** C **or** B and C
	(b)		G, E	2	B1 for G; B1 for E
	(c)		Hexagon	1	B1 cao
	(d)		Parallelogram	1	B1 cao
6	(a)		$3m$	1	B1 cao
	(b)		$7e$	1	B1 cao
	(c)		$15g$	1	B1 cao
7	(a)		31	2	M1 for 3 × 5 + 2 × 8 **or** 15 and 16 A1 cao
	(b)		$6x + 8y$	2	M1 for $6x$ **or** $8y$ A1 for $6x + 8y$ oe as final answer

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*8		Tables-R-Us 120 + (120 + 2 × 40) = 320 Fred's Furniture 120 + (32 × 6) = 312 Tables 'n Chairs 120 + (3 × 70) = 330	Fred's Furniture with working	4	M1 for correct method to find total cost of chairs (and table) for at least one shop M1 for correct method to find total cost of chairs (and table) for at least two shops A1 for 3 comparable totals (eg. chairs £200, £192, £210 **or** table and chairs £320, £312, £330) C1 (dep on M1) ft for correct statement with shop name from comparable figures
9			48	2	M1 for method to find 15% of 320 A1 cao
10	(a)		5	1	B1 cao
	(b)		evens	1	B1 cao
	(c)		$\frac{2}{6}$ oe	2	M1 for $\frac{a}{6}$ where $a < 6$ **or** $\frac{2}{b}$ where $b > 2$ A1 for $\frac{2}{6}$ oe
11	*(a)		No with working	2	M1 for 19.5 + 22.8 (= 42.3) **or** 40 − 19.5 − 22.8 (= −2.3) **or** 22 + 19 (= 41) C1 for statement with No and 42.3 **or** ±2.3 **or** 41 seen
	(b)		12 40	3	M1 for correct start eg. addition of two times **or** subtraction of one time from 1430 M1 for a complete method A1 for 12 40 (pm)

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
12			126 or 176	4	M1 for correct unit conversion of 2 m or 3 m or 20 cm M1 for method to find number in width or number in length **or** 14 or 9 or 16 or 11 M1 (dep on M1) for "number in length" × "number in width" eg 14 × 9 eg 16 × 11 A1 for 126 or 176
*13			Amsterdam with figures	3	B1 for a correct conversion from miles to km or km to miles eg 8 km = 5 miles eg 28 miles = 44 km M1 for a correct method to convert 280 miles to km or 500 km to miles **or** 420 – 460 (km) **or** 300 − 320 (miles) C1 (dep on M1) for statement with correct conclusion and correct conversions (420 – 460 km or 300 – 320 miles)
14			correct shape	2	M1 for at least 2 correctly enlarged sides A1 for correct shape **SC:** B1 for a fully correct enlargement scale factor 2 or 4
15	(a)		18	1	B1 cao
	(b)		56	1	B1 cao
	(c)		33	2	M1 for 23 and 56 identified A1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*16			No with reason	3	M1 for 17, 20 .**or** + 3 **or** $3n + 2$ M1 for method to show that 34 is not in the sequence eg continue sequence to at least 32 eg attempt to solve $3n + 2 = 34$ C1 (dep on M2) for statement with conclusion eg No with 32, 35 shown eg $n = 32 \div 3$ which is not a whole number
17			700 cm^3	3	M1 for $20 \times 5 \times 7$ A1 for 700 B1 (indep) for cm^3
18			4	3	B1 for 11.8 − 12.2 (cm) or 1180 − 1220 (km) M1 for "12" × 100 ÷ 300 oe A1 for 3.9 – 4.1 from correct figures or ft from "12" × 100 ÷ 300 oe
19			1340	4	M1 for 500 × 4 (= 2000) M1 for 960 – 300 (= 660) or "2000" + 300 (= 2300) or "2000" – 960 (= 1040) M1 (dep on M2) for a fully correct method eg "2000" – "660" or "2300" – "960" or "1040" + 300 A1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)		$\frac{5}{12}$	2	M1 for $\frac{150}{360}$ or equivalent fraction A1 cao
	(b)		42	2	M1 for 60 ÷ 12 (= 5) **or** 210 ÷ 60 (= 3.5) oe A1 cao
	(c)		not enough information	1	B1 for 'not enough information' ticked **and** appropriate explanation given
21			25	4	M1 for 600 ÷ 4 (= 150) M1 for 4500 ÷ "150" (= 30) M1 for 750 ÷ "30" A1 for 25 with supporting working **OR** M1 for 4500 ÷ 750 (= 6) M1 for 600 ÷ 4 (= 150) or 600 ÷ "6" (= 100) M1 for "150" ÷ "6" or "100" ÷ 4 A1 for 25 with supporting working **OR** M1 for 4500 ÷ 750 (= 6) or 750 ÷ 4500 (= $\frac{1}{6}$) M1 for $\frac{1}{4}\times"\frac{1}{6}"$ $\left(=\frac{1}{24}\right)$ M1 for $"\frac{1}{24}"\times 600$ A1 for 25 with supporting working

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*22			130 + correct reasons	4	M1 for angle *BFG* = 65 (may be seen on diagram) M1 (dep) for correct method to calculate *x* eg (*x* =) 65 + 65 (= 130) **or** (*x* =) 180 − (180 − 2 × 65) (= 130) C2 for *x* =130 **and** full appropriate reasons related to method shown (C1 (dep on M1) for any one appropriate reason related to method shown) eg alternate angles are equal ; base angles in an isosceles triangle are equal; angles in a triangle add up to 180°; angles on a straight line add up to 180°; exterior angle of triangle = sum of two interior opposite angles co-interior angles (allied angles) add up to 180°
23	(a)		2 reasons	2	B2 for two different reasons (B1 for 1 reason) eg No units (of distance) eg Overlapping intervals (2 and/or 3 in two boxes) eg Missing box (no box for more than 6 (km/miles) or 'other' or 4.5 (km/miles))
	(b)		Question	2	B1 for a suitable question which includes a time frame (time frame could appear with response boxes) B1 for at least 3relevant non-overlapping **and** exhaustive response boxes [Do not allow inequalities in response boxes]

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
24	(a)		$e(3e + 5)$	1	B1 for $e(3e + 5)$
	(b)		4	3	M1 for intention to expand brackets eg $7k - 21$ **or** division of all terms on RHS by 7 as a first step M1 for correct method to isolate terms in k in an equation A1 cao
	(c)		$a = 2f - 1$	2	M1 for a correct first step eg intention to multiply both sides by 2 A1 cao
25			$2 \times 2 \times 3 \times 3 \times 5$	3	M1 for continual prime factorisation (at least two consecutive steps correct) **or** at least two stages of a factor tree correct M1 for a fully correct factor tree **or** list 2, 2, 3, 3, 5 A1 for $2 \times 2 \times 3 \times 3 \times 5$ or $2^2 \times 3^2 \times 5$
26			9	4	M1 for method to find the area of one rectangle eg 15×8 (=120) or 15×11 (=165) M1 (dep) for subtraction from/by given area eg 138 − "120" (=18) or "165" – 138 (=27) M1 for final step from complete method shown eg 15 − "18"÷ 3 or for "27" ÷ 3 A1 cao **OR** M1 for a correct expression for the area of one rectangle eg $(8 + 3) \times (15 - x)$ or $8 \times x$ M1 (dep) for a correct equation eg $(8 + 3) \times (15 - x) + 8 \times x = 138$ M1 for correct method to isolate x eg $3x = 27$ A1 cao

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Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm

PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
1		Take out Jannu	
2	(b)	Table layout modified 2 cm grid provided with 14 squares across and 12 squares up Space on left and at the bottom for labeling	
5		Shapes H and I removed	
7		*a* changed to *e* *c* changed to *f*	
10		Spinner straightened up,● at centre to represent spike	
13		2 cm grid provided	
14		1½ cm grid provided Enlargement given Question reversed – 'Describe fully the transformation that maps Shape A onto Shape B	

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PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
15		Horizontal lines inserted to separate rows	
17		Model provided	

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Mark Scheme (Results)

November 2015

Pearson Edexcel GCSE
In Mathematics B (2MB01)
Foundation (Calculator) Unit 1

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PMT

5MB1F_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
1.	(a)		Black	1	B1 cao
	(b)		Fran	1	B1 cao
	(c)		Derek	1	B1 cao
2.	(i)		16	2	B1 cao
	(ii)		12		B1 cao
3.	(a)		A	1	B1 cao
	(b)		D	1	B1 cao
4.			£44.80 or 4480p	4	M1 for 8565 – 8437 (=128) M1 for "128" × 35 A1 for digits 448(0) C1 for £44.80 or 4480p ie clearly stated answer with correct money notation.

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
5.			Diagram or chart	4	B1 for a key or suitable labels to identify the Wizard and Reds. The key may be ignored if unclear provided the graph is clear, ie if different colours are used to shade in the graph. B1 for a diagram(s) or chart(s) set up for comparison showing data for at least 3 months eg dual bar chart, composite bar charts, frequency polygon, etc. B1 for correct heights for Wizards or Reds or totals C1 for a fully correct diagram or chart.
6.		(S,F), (S,M), (S,P) (J,F), (J,M), (J,P)	6 choices	2	B2 for all 6 choices with no extras or repeats (B1 for at least 3 correct; ignore extras or repeats)
7.	(a)		$\frac{3}{10}$	2	M1 for $\frac{a}{10}$ or $\frac{3}{b}$ where $a < 10$ and $b > 3$ A1 for $\frac{3}{10}$ oe
	(b)		$\frac{7}{10}$	1	B1 ft or for $\frac{7}{10}$ oe

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
8.	(a)		3	2	M1 for evidence of ordering A1 cao
	(b)		4	2	M1 for 6 – 2 A1 cao
	(c)		3.5	2	M1 for (3 + 6 + 2 + 2 + 5 + 3) ÷ 6 or 21 ÷ 6 A1 cao
9.			Data collection sheet	3	B1 for data illustrated for fruit (at least 3 items) or correct heading B1 for tally column or frequency column labelled B1 for suitable data collection sheet appropriate to the task e.g. with exactly 3 columns and which are all correctly labelled NB do not accept questionnaires or graphs

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
10.			67	2	M1 for at least three of 1 × 8, 2 × 6, 3 × 7, 4 × 4, 5 × 2 or at least three of 8, 12, 21, 16, 10 A1 cao
11.	(a)		15.86	4	M1 for 4 × 96 (= 384) or 3 × 56 (= 168) M1 for (“384” + ”168”) × 3 ÷ 4 oe or sight of 414 M1 for 20 – “4.14” or 1586 A1 cao **OR** M1 for 4 × 96 (= 384) or 3 × 56 (= 168) M1 for 20 – (“384” + ”168”) or 20 – “552” (= 1448) M1 for “1448” + (“552” ÷ 4) A1 cao NB allow work in £ or p for M marks
	(b)		7	2	M1 for 14 ÷ 1.84 or 7.60(8695…) or 12.88 and 14.72 A1 cao
12.	(a)		$20 - t$	1	B1 for $20 - t$
	(b)		$4x + 20y$	2	B2 for $4x + 20y$ (B1 for $4x$ or $20y$)

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5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
13.	(a)		20	2	M1 for $\frac{60}{360}\times 120$ A1 cao **OR** M1 for 360 ÷ 120 (= 3) or 60 ÷ 3 A1 cao
	(b)		50	3	M1 for 360 – (45 + 60 + 105) (= 150; could be measured) M1 for 360 ÷ 120 (= 3°) or "150" ÷ 3 A1 for 50; allow answers in the range 49-51 **OR** M1 for 360 – (45 + 60 + 105) (= 150; could be measured) M1 for $\frac{"150"}{360}\times 120$ A1 for 50; allow answers in the range 49-51 **OR** M1 for 360 – (45 + 60 + 105) (= 150; could be measured) M1 for $\frac{"150"}{60}\times "20"$ A1 for 50; allow answers in the range 49-51 **OR** M1 for working out how many in all three sectors M1 for subtraction from 120 A1 for 50; allow answers in the range 49 - 51

5MB1F 1F November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
14.	(a)		(146, 41)	1	B1 point plotted
	(b)		Description	1	B1 for description of dynamic relationship or statement of positive correlation
	(c)		155 – 158	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or a horizontal line from 47.5 A1 answer in the range 155 – 158 or ft from line
15.	(a)		Out: 1023/1148 Return: 1737/1918 in Colwyn 5h 49min	4	B1 for selecting 1023 train (cheapest out) B1 for selecting 1737 B1 for 5h 49min (spent in Colwyn) C1 (dep on at least B1) clearly stating departure and arrival times of both trains used and correct time in Colwyn for their trains
	(b)		133.40	3	M1 for 30% of any adult fare M1 for 2 × adult fare + 3 × child fare for at least one of their chosen trains A1 (accept 133.4) (SC B2 for £188.60)

5MB1F 1F November 2015					
Question	**Working**	**Answer**	**Mark**	**Notes**	
16.	<table><tr><td></td><td>Bus</td><td>Pre</td><td>Ec</td><td>Tot</td></tr><tr><td>M</td><td>(30)</td><td>28</td><td>34</td><td>(92</td></tr><tr><td>F</td><td>14</td><td>32</td><td>(62)</td><td>108</td></tr><tr><td>Total</td><td>(44)</td><td>(60)</td><td>96</td><td>(200</td></tr></table> ( ) value given	28	4	M1 for total female passengers 200 – 92 or 108 seen; or for total Economy passengers 200 – 44 – 60 or 96 seen. M1 for male passengers in Economy “96” – 62 or 34 seen; or for female Premium “108” – 62 – (44 – 30) or 32 seen M1 for 92 – 30 – “34” or for 60 – “32” A1 cao **OR** Answers may appear in a two-way table with no other method seen B1 for Female total 108 or Total Economy 96 M1 for “96” – 62 or 34 seen in Male Economy; or “108” – 62 – (44 – 30) or 32 seen in Female Premium M1 for 92 – 30 – “34” or for 60 – “32” A1 cao	

Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm

PAPER: 5MB1F_01			
Question		**Modification**	**Notes**
Q01		Row for Gary removed.	
Q02		Diagram enlarged.	
Q03		Crosses changed to filled in circles. Diagram enlarged.	
Q05		Value on table changed: Wizard: 20 28 18 32. Reds not altered. Grid enlarged.	
Q10		Frequency column widened to allow for working.	
Q13		Diagram enlarged.	
Q14	(a)	Grid enlarged. Crosses changed to filled in circles. 146 cm changed to 150 cm. 41 kg changed to 40 kg.	
Q15		Crewe to Colwyn – First 2 columns removed. Colwyn to Crewe – First and last columns removed	

PMT

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Question 13

This question was very poorly answered. Only a relatively small proportion of students were able to express multiply x by 10 in an acceptable format. Some mixed up multiply with divide, e.g. $x/10$ was seen, others knew the connection was a factor of 10 but were unable to write an expression, e.g x cm = 10 mm was given and another incorrect response was $x = 10x$. There were many instances of units being included within the expression they offered and this often made the expression invalid. Sometimes m was also given in the expression. It is fair to say that the majority of foundation students found this question challenging.

Question 7

This question was not well answered; $y = 7$ and $7 + y$ were the most common incorrect answers seen.

Question 8

Parts (a) and (b) were generally well answered. In part (a) a common error was to leave a multiplication sign in the answer, for example, $7 \times ab$ and in part (b), incorrect answers of $3y$ and $y3$ were often seen. Part (c) was poorly answered although many students were awarded one mark usually for either a correct numerator or a correct denominator. The most common mistakes made were either to simply count the number of each variable, for example, $\frac{3ef}{2e2f}$ or to sum the powers, $\frac{e^3+f}{e^2+f^2}$ both of which received no credit. An answer of e^1f^{-1} was given full marks although writing terms with an index of one is not to be encouraged. Cancelling of terms in the original expression was a correct method but this had to be carried out completely to gain any credit. The partially simplified answer of $\frac{e^3f}{e^2f^2}$ was very common and gained one mark. Another common incorrect answer was e^5f^3, where students had clearly just counted the number of each variable.

Question 11

Although a correct answer of 23 was often seen, many students are clearly unable to evaluate expressions by substitution, particularly when negative values are included. 3×-4 was often seen written as $3 - 4$ leading to an incorrect answer of 34 $(35 - 1)$. Many students ignored the negative sign and simply worked out $7\times5 + 3\times4$, 47 being a very common incorrect answer. A number of students were unable to deal with the addition of a negative number and incomplete answers of $35 + -12$ were not uncommon; which is a concern especially given that this is a

calculator paper. Only a very few students wrote an incorrect substitution of 75 – 34 or 75 + 34. Some weaker students wrote 7 + 5 + 3 – 4 = 11, scoring no marks.

Question 25

Only a very few students gained the full two marks in this question. Some did earn one mark for one correct entry, usually 8.3. Near misses included answers of $8.25 \leq y < 8.35$ indicating some understanding of error intervals but from a rounded rather than a truncated number.

Question 9

This was well answered for an algebra question, with many gaining the full two marks. If only one mark was awarded this was usually for $11e$. The most common incorrect answers were $11e - 5f$ or $11e5f$.

Question 15

This was a high scoring question, in both parts. A significant minority of students lost marks through mis-reading the figures in the question, typically using 5 instead of 50. The most common error was adding 70 and 50 first before multiplying by 4.

In part (b) the most common method was 680 – 50 then to divide by 70. Some students did $9 \times 4 \times 70 + 50$ which was probably the result of trialling rather than making use of inverse operations. A common error was to double the answer to part (a), concluding that if 4 weeks cost £330 then 8 weeks must cost £880.

Question 13

Part (a) of this question was answered very well and it was unusual to see students not receiving any credit for their response to part (b). The most common incorrect response to part (a) was p^7.

In responses to part (b) there was a significant proportion of students who collected the terms in x correctly and who collected the terms in y correctly only to give a final answer of $8x - y$. These students were awarded one mark. $8xy$ was also seen as a final answer quite frequently. Where this answer was preceded by "$8x$" or "y" as a standalone term in the working space, examiners could award one mark.

Question 21

This question was quite well attempted by most students sitting this paper, with a high proportion of students being awarded at least two of the four marks available for finding that there were 10 men and 20 children in the choir. Some students stopped at this point, giving 20 as their final answer.
However, many students did go on to write down a correct ratio and simplified it to .2 : 1.
Examiners allowed 2 : 1 for full marks though the question did in fact ask for only the value of n.

Question 8

Part (a) was answered very well. A few students misread the question and worked out the input for an output of 6.

Part (b) was also answered well. Instead of giving the answer as –20 or ÷3 some students omitted the operation and wrote just 20 or 3 in the number machine. They gained no mark.

Question 18

In part (a) it was pleasing that many students did manage to write a formula for T in terms of n even if it wasn't a fully correct formula that gained full marks. Students that started by writing down Chloe's age as $2n$ or Dan's age as $n - 5$ were awarded the first mark and tended to be the most successful. Common errors were expressing Chloe's age as n^2 or Dan's age as $5 - n$ or $-5n$. Students who used both $2n$ and $n - 5$ often went on to give a fully correct formula although some gave the answer as $n + 2n + n - 5$ or as $4n - 5$ and scored only two marks. Students with an incorrect expression for either Chloe's age or Dan's age were still able to get two marks for an answer such as $T = n + n^2 + n - 5$ or $T = n + 2n - 5n$. Some students failed to include the original n for Ben's age. Answers of $T = 2n - 5$ with no working were common and these gained the first mark only for $T =$ a linear expression in n. Some students thought they had to work out a numerical answer.

Many students were unable to select the identity in part (b). A popular incorrect answer was the inequality $x + 7 \leq 12$.

Question 20

Most of the students that substituted $f = 110$ into the formula obtained 452 and were awarded the first two marks. Many students, however, were not able to complete the solution by showing that the difference between 452 and the real height is less than 5% of the real height. Some made no attempt to do so. Others did make an attempt but could not show a complete method. Some found the difference of 10 but did not work with percentages whereas others found 5% of 442 but not the difference of 10. A common mistake was to find 5% of 452 instead of 5% of the real height. A

significant number of students did not use the formula correctly and gained no marks. Attempts at solving an equation such as $442 = 4f + 12$ or $110 = 4f + 12$ were quite common. Some students thought that they needed to round values because of the word 'estimate'.

Question 28

This question was generally answered quite well and it was pleasing that many students were able to gain the first mark for finding the number of workers used each day by Ali's company or by Hayley's company. Most went on to give a fully correct solution. Having found the two correct values (18 and 24) a few students did not complete the process by subtracting 18 from 24. Some students could not use the formula correctly and a common error was to work out 720×40 and 720×30.

Question 12

Part (a) was answered well demonstrating clear understanding of number machines.

Part (b) was less well done with a great many candidates unable to reverse the operations. Many assumed that the 41 was another input to be computed giving 79 as their answer. Some realised the need to take the operations in reverse order and so worked out 41 – 3 (= 38) or partially reversed the operations by dividing 38 by 2 thus failing to use inverse operators successfully. A number of candidates showed a correct embedded solution $22 \times 2 = 44 - 3 = 41$ but failed to identify 22 as their answer.

Question 30

Part (a) was answered correctly by only a small minority of students. Some demonstrated an intention to subtract 7 but never applied this to both sides of the formula. Many tried to subtract 6 from either/both sides and some simply swapped the p and q around to make q the subject.

In part (b), the usual incorrect answers of m^{-5} and m^{-6} were seen, but many did write correct answers.

Summary

Based on their performance on this paper, students should:

- read questions carefully.
- take care when presenting solutions. Too many students used the working out space for random calculations instead of an ordered, fully explained solution.
- ensure that they know how to find a fraction and/or percentage of a quantity.
- re-visit all aspects of bearings.
- know how to covert between metric units both of length and capacity.
- demonstrate algebraic processes in solving simple algebraic equations.
- fully revise angles on parallel lines.

Question 3

Many correct answers were seen. The majority of students gave the correct answer but the common incorrect answer was $7e$ suggesting that students did not process the $-e$ given in the expression.

Question 15

In part (a) only a few students scored one mark, most students either scored either no marks or two marks. The majority of students did score both marks but the main issue by far was incorrectly substituting in positive 7 instead of negative 7. Of those that successfully gained the first mark, some then did not subtract, but added 15 and 28 to get an answer of 43 even though they wrote 15 + – 28

Part (b) was not so well answered as part (a) although almost 40% of students scored full marks. Those that didn't gain full marks often received the first mark for substituting or for 38 – 18 = 20 but then didn't know to then divide by 4. A number of students could not substitute correctly into the equation and some students were not able to interpret $3x$ and $x = 6$ as meaning 3×6, with 36 seen here. Incomplete processing often led to only one mark being awarded.

Question 25

Students found this question challenging. Some scripts were left blank and others knew to use trigonometry but didn't know which to use out of sine, cosine or tangent, even when all the ratios were given correctly. Of those students that achieved the method mark, many could not then rearrange correctly to give the final answer. A common error seen was to try to use Pythagoras' Theorem or to try to use $\sin(34\times178)$ in their calculators.

Question 4

In part (a) there was generally one of two answers given here, either $4m$ or m^4. The incorrect answer was popular and only about two thirds of the cohort gave the correct answer.

Part (b) was answered more accurately with over 80% of the cohort giving an acceptable answer.

Question 13

The majority of students scored both marks in part (i) calculating the angle to be 21 degrees. A small number of students used 360 in their calculation instead of 180 and this resulted in an incorrect answer of 201 degrees. The other error most often seen was arithmetic, again suggesting that students may have been reluctant to use their calculator for this question.

Part (ii) was less well answered. Students who did score the communication mark often wrote ‘angles on a straight line add up to 180’. The mark was most commonly lost for missing out the word angles, other incorrect response included, ‘half a circle is 180’, here neither angle nor line were mentioned. However, the most common error was for students to state or re state their numerical calculation without mention of geometrical properties. Centres should encourage students to write short succinct explanations.

Question 20

Both parts of this question were similarly accessible to students. Approximately half of the cohort got each part correct. In part(b) the most common incorrect answer was d^7

Question 6

In part (a) the minority of students who answered incorrectly did so since they either only partly simplified, leaving in a × sign, or wrote part of the expression in index form, usually either ab^4 or 4^{ab}.
In part (b) many students got $3x + 8$, but some tried to simplify further to $11x$.

Question 11

In part (a) most students used a non-calculator method and obtained the correct answer. It was obvious when calculators were used where an answer of 196 ÷ 603 = 3 h 26 min was seen. Many gained 1 mark for getting as far as 3 hours.
In part (b) it was very rare to see any correct answers. Some wrote down the formula triangle for speed distance but could not relate this to an algebraic expression. The closest many students got was $2x$, the most common incorrect algebraic answer.

Question 2

The usual error in collecting these four algebraic expressions was to give an answer of e^4 instead of $4e$, carelessly reading the operation as '×' instead of '+'.

Question 14

Basic arithmetical errors prevented many students gaining full marks here. $24 – 5$ and/or 6×4 were often seen calculated wrongly. The most common error was through incorrect substitution, usually resulting in $64 – 5 = 59$ or $6 + 4 - 5$. Some students attempted to balance and solve the equation.

Question 12

Students were able to use the number machine in part (a) and the vast majority of students gave the correct answer and scored the mark available.

Part (b) was generally well answered with most students achieving full marks. An answer of 6 was often given with no further working shown. Of the successful answers with working,

by far the most common method seen was the use of the inverse operation working backwards from 154. Those unable to give the final answer often gained a mark for partially correct working out, usually 154÷11 =14. Some students did try to work with an unknown and 88 or 154 – 88 was often seen but not many using this method seem to complete the process and give an answer of 6. Those students who got as far as 154 – 88 or stating 66 were able to gain one mark. The most common incorrect answer seen was 13.27 from subtracting 8 from 154 first and then dividing by 11.

Question 4

This question was well answered with most giving the correct answer of $6m$. Common incorrect answers were $5m$ or $2m^3$.

Question 24

In this question many students were able to find the number of counters each person would get. There were two main routes to these values: algebraic and numeric. Weaker students started by dividing 54 by 3 but were then unsure of where to go from there.

Students who adopted a clear algebraic approach often went on to solve the question completely. However, students occasionally ended up with $4x - 6 = 54$ rather than $5x - 6 = 54$, due to not understanding that Tony had six less counters than Selma rather than Rick.

Most students adopted a numeric approach, and most were successful in arriving at the three numbers 12, 24 and 18 scoring three marks.

Students were less successful in converting the counters each had into a ratio between Rick and Tony. Where students managed this, they usually then went on to gain the full marks for $p = 1.5$ but those who did not recognise this unitary ratio expression were sometimes put off from writing their ratio of Rick to Tony.

Question 5. Many students failed to score in this question by not simplifying the given expression fully. $3w \times 5t$ and $15 \times wt$ were popular partial simplifications gaining no marks.

Question 14

In part (a) this simplifying question was answered very well, with the majority of students being awarded both marks. The method mark was often awarded for correctly collecting like terms for one variable but often lost the second mark due to an error when working with $7d$ and $-d$. Commonly seen errors included an extra step to combine $7c$ and $6d$ to get a final answer of $13cd$ or, when working with the d variable, either misinterpreting the negative sign to get $7c - 6d$ or forgetting that this represented $1d$, resulting in $7c + 7$ being stated as the final answer. A less frequent error was to use powers when collecting like terms.

In part (b), students often struggled to expand the bracket correctly by only multiplying 5 by 2m to give 10m but failing to multiply 5 by 6 as well. Students that did correctly expand the bracket generally solved the equation successfully, with almost half of students scoring full marks.

A significant number of students attempted to solve the equation using trial and error rather than algebraic methods. This approach scores either full marks or zero marks and should not be encouraged.

In part (c), responses were encouraging. Students demonstrated a good understanding of how to write the expression $3x + 2y$ correctly, with again almost half of the cohort scoring full marks.

Where candidates failed to gain full marks, some gained one for having one of the terms correct but most failed to score at all. Often this was due to using powers or a subtraction sign or even missing the sign altogether.

Question 22

Many students did not recognise the need to use trigonometry in this 2 mark question, with many trying to work with the area, finding missing angles or using Pythagoras' theorem. Of those who did recognise that the use of trigonometry was needed, many selected to use the wrong ratio, with Sine being the most common incorrect ratio used. When the correct ratio was used, the majority of students found a correct answer within the acceptable range.

Of the students gaining only the method mark, it was often due to early rounding of figures. The incorrect use of the Cosine ratio due to writing cos (53 × 14.5) was occasionally seen so students should be encouraged to practice the correct use of trigonometric ratios and have a better understanding of the order of operations applied.

Question 18

Understanding of algebraic formulae was very poor indeed, with the most common incorrect answer being $T = b + c$ but $33 = 5 + 28$ and $33T=5b + 28c$ were also regularly seen.
Often when students did find the correct formula, they tried to simplify it giving $T = 33bc$ as their final answer.
Weaker students struggled to gain any credit at all in this question.

Question 4

Simplifying a simple algebraic expression seemed to cause very few problems for most students. Common incorrect responses included $82t$ or $7t$ from not applying the correct operator.

Question 3

This question was well answered. Most candidates were able to state the correct answer of $4m$. Weaker students wrote the answer incorrectly as m^4.

Question 19

This question was attempted by most candidates, but few achieved full marks. Many candidates gained 1 mark, often by calculating 450 ÷ 6 and getting an answer of 75; or for finding '450 is 15% of 3000'. Unfortunately, many candidates were not able to progress past this point in their calculations and gained no further marks. Some candidates were able to take the calculation further but failed to finish the calculation giving final answers of 0.025 or 1.025. A common incorrect approach was to consider this to be a compound interest question and to use the compound interest formula.

Question 13

In part (a) man candidates correctly simplified the coefficient to 20 but there were numerous errors with the power of h, especially giving the power as 9 or 6. Quite a few candidates showed $22h^6 - 2h^3$ in the working box but their final answer was often correct, suggesting that they were adding and subtracting both the coefficient and the power. Many times the candidate was seen to be applying the power to the co-efficient, leaving out the h altogether before popping it back on to their answer at the end.

In part (b) Most candidates used order of operations correctly and got the correct answer. Some chose to divide each term in the bracket by 3 and sadly failed to simplify their answer and left as $3y + 4y$. It was also common to see the y dropped and the answer of 7 just given.

Question 9

In part (a) the majority of candidates were able to correctly calculate the output of the number machine for an input of 16. Incorrect answers, where seen, tended to be the result of an arithmetic error, for example $26 - 10$ incorrectly evaluated as 6, or from working with only part of the number machine leading to answers of 26 or 3.
Part (b) of the question was also well answered. Where candidates did not correctly find the input which would give an output of 28, they were often able to gain partial credit for a start to a method to use inverse operations, often by working out $28 + 10$. The most common incorrect answers were 46 or 9 which came from the result of using an input of 28 rather than using this as the output or from subtracting 10 from 28 and then dividing by 2.
Where candidates knew to add 10 and then divide by 2, dividing 38 by 2 proved problematic. There were many instances of students performing the inverse operations correctly, getting the answer 19 then writing a different number on the answer line. Other candidates obtained an incorrect answer of 36 by calculating $(28 - 10) \times 2$, therefore only partially using inverse operations. Many candidates found it useful using the number machine to write their workings, helping them to answer the questions step by step.
In the final part of this question students were asked to show that there is a number for which the output of the number machine was the same as the input. Many candidates were able to correctly identify 10 as this number and the majority showed that this was the case either by indicating that $10 \times 2 = 20$ and $20 - 10 = 10$ or by showing the number machine with an input of 10 and an output of 10. Where candidates did not show that an input of 10 gave an output of 10, they were often able to gain partial credit for identifying that 10 was the value which met the requirements of the question without showing that this input gave a matching output or for a correctly evaluated trial. Partial credit was also available for candidates who had made a correct trial of a number different to 10. The most common incorrect answers seen were where candidates changed the number machine used in order to make their input and output match, often by changing the amount subtracted.

Question 5

Students generally completed the statement for a simple algebraic expression correctly and were awarded the mark.

Question 13

The expression in part (a) was often simplified correctly, with over half of the cohort being awarded the mark. The most commonly seen error was to add the coefficients rather than multiply or still including multiplication signs.

Success in part (b) was very pleasing with a significant proportion of students demonstrating they understood substitution of negative numbers and could also evaluate correctly to score full marks. The most common incorrect answers stemmed either from doing $3 + 2 – 4$ instead of $3 + 2 \times (-4)$, or from evaluating incorrectly as -20 due to failing to apply the correct order of operations. The use of brackets $3 + 2(-4)$ was sufficient for students to achieve the method mark for a correct substitution and students should be encouraged to include brackets around negative values in every topic as this would mean incorrect evaluation from poor calculator use could be avoided.

Question 4

This question saw varied results; the majority of students were able to simplify correctly to reach an answer of $3a$. Unfortunately, some commonly and incorrectly answered with "$2a$" and "$12a$" gaining no marks. Some students failed to fully simplify their answers and gave the answer of $8a - 5a$.

Question 16

Most students were able to give a correct answer for part (a); the most common incorrect answer seen was $4m$.

Part (b) was not answered as well, with much fewer students able to gain the full 2 marks for an answer of $5x + 2y$. Of those that didn't, some were able to gain 1 mark for either $5x$ or $2y$ or a linear expression in the form $ax + by$ where $a, b > 0$. Some students gave a correct expression but included it in a formula e.g. $T = 5x + 2y$ which gained only 1 mark as students were being assessed on their understanding of the term 'expression'. A significant proportion of the cohort scored 0 marks and the majority of these students generally did not understand the context of the question. Common incorrect solutions did not include x or y e.g. $5 + 2 = 7$ or multiplying 5 and 2 by some chosen values and finding the sum of the products.

Question 13

In part (a) of the question learners were asked to find the output of the number machine when the input was 11. The majority of learners were able to do this correctly often showing their working to achieve the answer of 8. Only a minority of learners made errors in arithmetic in otherwise correct working. A common incorrect answer was 13.5 which arose from learners applying order of operations rules to the two separate steps within the function machine. Another incorrect approach was was putting the output as 11 then calculating either $\times\ 2 - 5\ =\ 17$ or $\frac{11}{2} + 5 = 10.5$.

Part (b) of this question required learners to complete the number machine by adding the missing operation. This was answered well by the majority of learners, although caused slightly more difficulty than part (a). The answer of -3 was much more common than $\times\ 0.7$ Where learners were not able to find either of the possible answers they were often able to gain 1 mark for finding 7 as an intermediate step or dividing 28 by 4.

Some learners did not transfer their answer over to the function machine, leaving a choice of methods and answers. Candidates need to ensure they are identifying their answer and not just leaving it in the body of their working.

Question 21

A significant majority of learners struggled with this question which used the angle properties of parallel lines and it was very rare to see a fully correct answer. The majority of learners did not correctly identify any of the angle results that could be obtained by using angles in parallel lines. Where marks were awarded, this was often for identifying angle ACD as being e and gaining the first mark. Some learners identified ABC as $3e$ or referenced the sum of angles in a triangle being 180° but these alone did not gain marks. It was common to see angle DAC being incorrectly identified as e or multiple angles labelled with e, $3e$ or similar. Very few learners were able to give an appropriate reason even when they had found a correct angle.

Question 11

Simplifying the algebraic expression involving multiplication in part (a) was well done by a large majority of the cohort. Success in part (b) was more varied though, with scores of 0, 1 and 2 marks being awarded in equal proportions. It was common for learners to become confused with the minus sign, and one of the most common wrong answers was $5d - 5e$ but such answers were awarded 1 mark for correctly showing a partial simplification and $1d + 5e$ due to dealing with the signs incorrectly. Answers of $5d + - 3e$ scored only 1 mark as they were not fully simplified, but this was rarely seen.

Question 27

This question was not attempted well by the majority of the cohort. Learners often attempted to convert from standard form to ordinary numbers, which gained no credit and was not necessary, but rarely recognised that they should then be attempting a division. Sometimes a partial mark was awarded for finding the figures 3125 but this was rare. A very small minority were able to reach the accurate answer for 2 marks. Practising use of a calculator for manipulation of numbers in standard form would be helpful for learners.

Question 12

This question saw mixed results. A good number of learners were able to give a correct expression. Some gave the correct expression but did incorrect further working such as 'simplifying' to e.g. $13xy$ or 13, gaining M1A0. Some also turned their expression into a formula such as $T = 6x + 7y$ or $Total = 6x + 7y$, showing a lack of understanding of the definition of an expression. There were also a good number who gave expressions that were completely incorrect such as $x^6 + y^7$. Some learners used a and o instead of x and y, this could only gain credit if a and o were defined as number of packs of apples and number of bags of oranges respectively.

Question 25

Although part (a) saw mixed results, it was pleasing to see some learners pick up 2 marks at this stage of the paper. Some gained B1 as they were not able to simplify all 3 terms but managed to do so with 2 terms; the y power as 5 instead of 6 or the coefficient as 9 instead of 14 were often seen. Many learners were not able to give an answer in the correct form e.g. some gave their answer as an addition, whereas others appeared not to be able to make any sort of correct start. Some that got the three terms correct only gained B1 due to the inclusion of multiplication signs. Part (b) saw a good number of this cohort able to gain B1 with a correct answer. That being said, many were not able to simplify the powers correctly; common incorrect answers were m^{-1} and m^5.

Question 1

Learners were generally able to simplify the algebraic expression by collecting like terms. Common errors were giving the answer e^5 or 5^e which came from misconceptions around the meaning of indices.

Question 9

In part (a), learners were told that Greg was x years old and that he was 5 years older than Katy. They were then asked to write down an expression, in terms of x, for Katy's age. Correct responses of $x - 5$ were awarded 1 mark, sometimes an equation such as $k = x - 5$ was given which was condoned. Common incorrect answers included $x + 5$, $5x$ and expressions which were not given in terms of x. An understanding of the term 'expression' was not always present. Some gave a numerical value given for what they thought was the age.

In part (b), learners were told that Carl is twice as old as Greg, and were asked to write down an expression in terms of x for Carl's age. Learners were often able to correctly give $2x$ or $x \times 2$. Common incorrect answers were x^2 or, in common with (a), responses which were not in terms of x.Solving $4y = 12$ was answered successfully by many learners. Where incorrect responses were seen these commonly included 48 (multiplying 12 by 4 rather than dividing) or 8 (from 12 subtract 4).

Question 13

This was a fairly standard question on working with number machines. In part (a) learners were asked to find the output given an input of 6, this was generally well answered with many learners reaching the correct answer of 10. Where incorrect answers were seen these were often from errors in arithmetic.

In part (b) learners were asked to find the input when the output was -11. In many cases learners were able to identify that they should use inverse operations to reverse the stages of the number machine and correctly found that $-11 + 8 = -3$ and $-3 \div 3 = -1$ giving a correct answer of -1. It was common to see learners who could identify the inverse operations needed (+8 and ÷3) but made errors in evaluation, often in working with negative numbers, this led to a common incorrect answer of 1. Others started a method using inverse operations, $-11 + 8$, but multiplied by 3 rather than dividing. Another common error was to use the -11 as the input rather than the output.

Question 22

The first part of this question required learners to work with fractions of amounts, dividing in a ratio then writing a ratio and simplifying. Most learners were able to make a start to the process by finding $\frac{1}{7}$ of 280. It was also common to see the correct processes to divide the remaining 240 chocolates in the ratio $1:3$ which was required for the next two marks. Writing the ratio of white chocolates to dark chocolates and simplifying accurately proved more challenging for learners. As with other questions, errors in arithmetic were seen which meant that the final accuracy mark was lost, however the process marks could be gained.

Common errors in the process were to divide 280 in the ratio $1:3$ having neglected the $\frac{1}{7}$ of the chocolates that were dark chocolates. Others assumed that the ratios $1:3$ and $n:1$ meant that there were equal numbers of milk and dark chocolates.

A less common approach, but one which was generally successful when seen was working with the fraction of each amount, identifying that there were $\frac{1}{7}$, $\frac{1.5}{7}$ and $\frac{4.5}{7}$ for dark chocolates, milk chocolates and white chocolates before then selecting 4.5 as their correct answer.

In part (b) learners were told that 10 milk chocolates were eaten and asked whether this affected their answer to part (a). This proved to be a challenging question for learners with many stating that it did impact their answer. Where correct responses were seen these generally identified that changing the number of milk chocolates did not impact the number of dark chocolates or white chocolates.

Question 2

Simplifying an algebraic expression using multiplication was well answered.

Question 9

This question required learners to use knowledge of angle facts and provide a reason. Learners set out their work in a variety of ways, but the most common was to add the two given angles before subtracting the total from 180. A complete method was required in order to award the first mark, so simply adding 85 and 30 was not sufficient and was the most common reason for responses not gaining credit along with subtracting from 360 rather than 180. However, it was pleasing to see a number of learners successfully attempting to answer the question by considering the sum of the angles around the point and including the 180º below the line as part of their calculations.

A wide variety of attempts at stating the reason in part (ii) were seen, with the mark scheme showing the underlined words that were needed as a minimum requirement for the mark to be awarded, namely angles and line. Learners should be encouraged to learn and be able to recall angle facts and be aware of key words to include as part of a reason as calculations alone are not enough when a reason is required. Very few responses contained a contradiction such as angles on a straight line total 360, but when a contradiction was seen within the reason, the mark was not awarded as per general marking guidance for C marks.

Question 13

In part (a), the mark was awarded for n^3 and there were many incorrect responses seen. Common incorrect responses that were seen included $3n$ or $n3$ or giving a choice of both the correct answer and an incorrect answer. It is important for learners to practice writing indices correctly as it was frequent for the index of 3 to not be clearly written as a power and shown as a normal number.

Part (b) required an equation to be rearranged. A correct first step was required for the M mark and many learners demonstrated this by adding 4. However, this had to be carried out on both sides of the equation, meaning that the first mark was not awarded for just showing +4 next to both sides of the original equation with no attempt to evaluate or for showing only $26 + 4 = 30$. Arithmetic errors were allowed as shown in the additional guidance of the mark scheme. It was possible to begin this question by dividing through by 5, and again the mark was only awarded if it was carried out, but this approach was seldom seen. Some responses used a 'function machine' approach such as $26 + 4 \div 5$ and was often correctly evaluated, but on occasion, the order of operations was not used correctly leading to an incorrect final answer, which was condoned for the first mark only.

Question 25

This was the largest question in terms of marks available, and as such it required several stages of workings to reach the correct answer. The usual start was to begin by working with the mean of List A, ideally by adding the given numbers and dividing the total by 4. If carried out correctly this scored the first mark, but occasionally incorrect order of operations as seen but condoned. For learners who had made a slip in finding the mean of List A, the award of the subsequent three process marks was looked for, with learners being allowed to use what they believed to be the mean for A in the ratio work to gain the second and third marks, and in the calculation to find the total in List B for the fourth mark. Therefore, working with the total of the numbers in List A, often 972 or 867.75, was acceptable for use as [A] on the mark scheme in the following P marks, as were the median, range or any value in List A with the second and third marks often being awarded for correct use of ratio. The alternative process involving the use of algebra to set up and solve an equation for the missing element of List B was equally acceptable. This approach was very seldom seen on the Foundation paper and was typically incorrectly, often due to omitting x or any other letter to represent the missing value which was needed for this approach to gain credit.

Whilst the first mark was often awarded, this was usually the only correct process seen as many learners did not know how to work correctly with the ratio and tried to divide by 8 instead.



Examiners' Report
Principal Examiner Feedback

November 2020

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 3F

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GCSE (9 – 1) Mathematics – 1MA1
Principal Examiner Feedback – Foundation Paper 3

Introduction

The overall quality of the presentation of work was good. However, students need to read the questions carefully. There remain a concerning number of cases where students copy down the wrong figures from the question, mis-copy their own figures, or round figures almost randomly. Equally another error sometimes occurs when students prematurely round or truncate figures, either their own figures or figures from the calculator, which usually result in lost accuracy marks and could also make questions more difficult than they were designed to be.

Approaches to questions that required some interpretation or explanation were inconsistent. Questions 10 and 21 were answered well, but poor attempts were made in questions 15 and 26. On too many occasions students included contradictory or incorrect statements, which cannot be credited.

Within a broad range of questions, the paper was able to discriminate well. Weakest areas continue to be the application of ratios, scales and rates, but also algebraic manipulation and problem solving. Most demonstrated good use of a calculator, though on some occasions it was clear that they did not have an understanding of the way in which their calculator worked or did not have one at all, such as in question 9.

Questions which had a slightly unexpected approach, that is required more thought, caused immediate problems for many, even in the earlier part of the paper. This includes questions 18, 20 and 24. Question 25 to 29 were the more challenging questions for those striving to demonstrate ability at the highest grades available, and a significant proportion of students therefore failed to score on these questions.

There were far fewer attempts using trial and improvement approaches. These mainly occurred when students showed evidence of not having a calculator, mainly evident in questions 15, 18, 19 and 20 where non-calculator methods were also seen, such as multiple additions.

The inclusion of working out to support answers remains an issue for many; but not only does working out need to be shown, it needs to be shown legibly, demonstrating the processes of calculation that are used. This is most important in longer questions, and in “show that” questions.

Report on Individual Questions.

Question 1

This was a poorly answered question. Most students gave the correct answer of 3 but 300, 30 and 3000 were frequently seen.

Question 2

A well answered question with nearly all giving the correct answer of 8.

Question 3

This was not always answered correctly.

Question 4

There were few incorrect answers in this question.

Question 5

This was very well answered with few failing to gain the mark. The most common error was the absence of one of the numbers.

Question 6

A very well answered question. There were a few who gave the answer of 4 to part (a).

Question 7

Students were generally very successful with this question with most obtaining full marks. Those achieving partial marks tended to mis-read the shaded section and recorded the fraction unshaded instead leaving their answer as $\frac{1}{4}$. A significant minority failed to give their answer in its simplest form, usually leaving the answer as $\frac{12}{16}$.

Question 8

This question was generally well done with the majority dividing 200 by 25 (some with multiple additions of 25) and then completing the process of 9.75 × 8 and giving the correct answer 78. Some students preferred to list eight lots of £9.75. The most common errors were students multiplying the cost by 200 or by 25.

Question 9

Parts (a) and (b) were not always answered correctly, with students having difficulty with the order of operations on their calculators.

It was rare to see any correct answers to part (c). Knowing the meaning of the term “reciprocal” is clearly a weakness in students.

Question 10

Most students got the marks in parts (a) and (b).

In part (c) students were able to explain that the drop in the first 3 minutes was steeper than the last 3 minutes. Some struggled to articulate this and some forgot to agree and imply that Pam was correct. There were a wide variety of values presented by students, although this question assessed the interpretation of the graph rather than the accuracy of reading values. Students generally used suitable values to explain their reasoning. Some students didn’t use the graph at all but tried to explain that water cools more quickly when it is hotter.

Question 11

Many responses achieved full marks. Many managed to use the fact that angles in a quadrilateral sum to 360 or found the angle on the straight line to y was 70 degrees and score one mark. Not all students who correctly calculated angle PSR were able to complete this question correctly, deciding to go off in all sorts of related incorrect calculations. Some of the weaker students knew that angles on a straight line totalled 180° but chose to use angle QPS with angle y to sum to this total.

Question 12

Part (a)(i) was well answered. In parts (a)(ii) and (b) it was clear students did not properly understand the meaning of "term". This was evidenced by statement involving algebra, "nth term", "n –5" and numbers not relating to the sequence given in the question.

Question 13

Many students added up the numbers that they saw on the diagram to get an answer of 26. Many more managed to score at least one mark on this question as they identified the length of one of the missing sides, usually on the diagram. For some reason finding 2cm was much more prevalent than finding 6cm. Some then forgot to find the missing length of 6cm leading to an answer of 28. The majority understood the meaning of perimeter, but some divided the shape into rectangles and added together the perimeter of both rectangles. The other common mistake was trying to find the area.

Question 14

In part (a) most students understood the need to collect like terms and it was often done successfully. If full marks were not awarded, students usually achieved one method mark, usually for the $5x$.
The negative sometimes caused problems when collecting the y terms. Common errors seen included $6xy$ and $5x^2 \pm y^2$.
Part (b) was well done by many with the answer 3 on the answer line, though a formal algebraic approach was not seen very often, students preferring to show 22 – 7 ÷ 5. Some showed "–7" written by the equation but this was not credited unless the next stage was shown by, for example, writing $5p$ =15. Few attempted to divide by 5 as their first step. The most common incorrect answer seen was 10 from subtracting the 5 and 7 from 22.

Question 15

There were some good attempts at this question, encouraging since there were several steps needed to get to the answer: division to get the number of packs and rounding 7.5 to 8 before calculating the cost. Conclusions were well stated. The common error was to work out the individual cost of the batteries in each shop and then find the cost of 30 which clearly demonstrated misunderstanding about the packs.

Part (b) was usually well stated with 'No' and a clear reason. Most calculated the cost of 30 individual batteries of £12 and £13.50 and stated 'No, shop A is still cheaper'.

Question 16

In part (a) the majority wrote the correct answer on the answer line. Some went on to convert their answer to a decimal which was unnecessary. It was also pleasing to see most students using the

correct notation for probability with only a minority using the incorrect notation of a ratio. Of those not gaining both marks, most earned M1 for $\frac{5}{n}$ or $\frac{m}{11}$.

In part (b) a common incorrect answer was 0.3, but the majority of students gave the correct answer of 0.7, which was sometimes written as an equivalent fraction.

Question 17

The majority of students attempting this question gained full marks. There were many who gained 1 mark for drawing only one 6cm line correctly, though quite a few struggled to draw an accurate isosceles triangle. Though they were not required in this question, there was very little evidence of construction lines/arcs drawn; it seemed most measured using their rulers.

Question 18

Many students secured one mark for providing an accurate conversion using the graph. However, others drew lines on the graph, not always correctly, but failed to take any accurate readings from these. Of those that did, most went on to complete the method, but many of these confused their $ with £ and so lost the method mark. Other students chose to take their initial reading near the origin, for instance using £5 = $6, which by the time they had multiplied it up to $345 was too inaccurate to give an answer within the range allowed. There was some misunderstanding of the scale on the $ axis, with some students assuming 1 small square = $1

Question 19

In part (a) to achieve both the marks, students needed to understand through proportional reasoning that the number of tuna sandwiches represented 40% of the total sold. Many students were not able to demonstrate this and as such scored no marks. There were some who adopted a bar modelling approach e.g. stating 40% = 56 so 20% = 28, and adding 56 + 56 + 28.

Part (b) was answered slightly better, but still demonstrated that students need more practice of ratio and proportion. Where students showed some understanding of what was required but chose to use a percentage of 18 to scale up were often not able to achieve a solution that was accurate enough.

Question 20

Students that were able to demonstrate some understanding of the context were rewarded with one of two process marks if they able to sum the total of money (200) that Akhtar, Ben and Carl had without the £10 notes or used the mean amount to calculate the total of all the money (240). After scoring one or two process marks there was a variable understanding of how to use these values to solve the problem. Of those who made mistakes many appreciated that the answer had to be an integer and rounded their mistakes rather than reflecting that there had to have been an error and a further check of their work was needed.

Question 21

Part (a) was answered well, with many students gaining the mark. The most common incorrect answer was $\frac{25}{50}$, a probability statement rather than a statement of the number of times.

In part (b) some students thought that the answer was Paula because "10 times was enough" as her approach was quicker. Lots of students had the right idea that the more trials, the more reliable your results, but some failed to actually say "Simon, because…" A common mistake was just talking about 100 throws and not making comparisons.

Question 22

This question was attempted by most students but very few correct plan views were seen. Most students incorrectly drew a net or a side elevation involving a square with a triangle attached. Out of the ones who scored any marks, most scored one mark for a square with sides 6cm, but without the diagonals drawn.

Question 23

Part (a) was not well answered. n^{15} was a common incorrect answer.

In part (b) c was usually shown correctly (frequently written as c^1 but often paired with d^4). Most achieved one mark for c or (less likely) d^3. There were a significant number of correct values for c found from an incorrect method.

In part (c) many students were unsure where to start and a common incorrect answer given was $2.5x > 7$. Of those students who did start to approach the question correctly, many ignored the inequality sign throughout the process getting $x = 2.8$ or $x = \frac{14}{5}$ and as a result could not gain the accuracy mark.

Question 24

Most students attempted this question but very few achieved full marks. The distance, speed, time triangle did not help in this question; students always seem to make more errors at this level when using it rather than taking an everyday approach to the problem. Some added the distances together and the speeds together then divided by 2. Quite a few students gained one mark, but more students gained two marks for finding the times as decimals and adding the two times but failing to convert the times correctly and ended up with 2 hr 75 mins or 3 hr 15 mins which were the most common answers seen.

Question 25

Error intervals remain a weakness and was poorly attempted. Some were able to correctly give 9.35 but rarely gave 9.45; a few 9.44 but not 9.4499...

Question 26

Many were able to secure the first process mark for finding the area of one of the lawns (45 m^2 or 140 m^2) or the amount of seed available (10kg) but did not proceed any further with many reasoning incorrectly that if 3kg covered 5 × 9 area, then 6kg would cover 10 × 18, more than is needed. Other students were successful in gaining the second process mark mainly for the coverage of 1 kg of grass seed ($15m^2$). The most successful approaches seen where students were able to reach the correct conclusion were finding the amount of grass seed needed (9.3…kg) and comparing it with 10kg or finding the area that could be seeded with 10kg ($150m^2$) and comparing it with $140m^2$.

Part (b) required reasoning supported by correct figures and as a result, students were not successful in gaining many marks.

Question 27

Part (a) was generally answered well, and most students were able to write at least two correct probabilities on the tree diagram, sometimes writing these as equivalent fractions of $\frac{2}{4}$2/6 and 4/6. Some students chose to try to use decimals for this problem but were not able to score any marks due to inaccurate approximations of $\frac{1}{3}$.

Having perhaps achieved one or both marks in part (a) many students lacked the knowledge that they needed to select the correct branches and multiply the fractions together and the few that did were rewarded with the marks in part (b).

Question 28

There were very few correct answers in part (a). There seemed little evidence of an understanding that the solutions could be read from the graph. A significant number attempted an algebraic solution, but their algebraic abilities were insufficient for such a task.

In part (b) there were a few who got full marks but for those who knew to read from the intercepts often included 2 with 0.6 and 3.4. Some spoilt their answers by writing the two values as coordinates. Other errors included those who attempted to substitute values into the equation, then plot the points on the graph, using algebraic solving/factorising methods or stating the *y* value at the minimum point.

Question 29

Many started off knowing that they needed to multiply the dimensions 6, 4 and 10 but many failed to take into account that the end shape was a triangle and division by 2 was required. The biggest failing, after calculating the volume correctly, was to divide by 0.8 getting the answer 150. For those students that only omitted division by 2 there was a special case mark for the answer of 192.

Summary

Based on their performance on this paper, students should:

- accurately transcribe figures taken from the question, and taken from their own work
- avoid rounding or truncating answers, and to use the most accurate values in subsequent calculations
- ensure that their work is legible for examiners to consider awarding marks. For example, avoid any possible confusion when writing 1s and 7s, when writing 4s and 9s, and even when writing 0s and 6s.
- ensure that they include working out to support answers
- work on algebraic manipulation and derivation, and application of ratios, scaling and rates in preparing for future examinations.
- learn the meaning of technical terms such as “reciprocal”, the “term” of a sequence and error intervals
- continue to need practise answering response type questions where a written explanation is required.

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Examiners' Report
Principal Examiner Feedback

November 2022

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Non-Calculator) Paper 1F

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GCSE Mathematics 1MA1
Principal Examiner Feedback – Foundation Paper 1

Introduction

The paper offered an opportunity for students of all abilities to demonstrate their understanding of a variety of mathematical concepts.
The early questions acted as a good confidence building way into the paper, with many students gaining a good proportion of the early marks.

Lack of careful reading of some of the questions was a cause for concern; particular ones are quoted in the summary below. Also worrying is the number of arithmetical errors that featured in many students' work. Simple application of the four rules was found wanting on many occasions. For example, 10000/8 being seen as 8/10000. Students should be encouraged to check working before being totally satisfied with their answers.

Some students were clearly avoiding tackling questions that involved algebraic techniques. These attempted trial-and-error methods from quite early on in the paper, even for the simpler questions where an algebraic approach was straightforward.

The quality of handwriting from some candidates made their responses difficult to read. Students are advised to avoid rushing through their work.

Areas of the curriculum that need more attention are, Geometric reasoning (Q9b), Describing transformations (Q11), Equation of a straight line (Q11bii), Fractions (Q20), Indices (Q21) Comparison of ratios (Q24) and Factorisation of polynomials (Q26b).

Again, it was pleasing to see many students clearly showing their working and utilising their communication skills when required. This continues to be an area of improvement.

Report on individual questions

Question 1. This first question was generally well answered and served as a good introduction to the paper. Correct answers of $\frac{3}{10}$ or $\frac{30}{100}$ were the most common.

Question 2. This question was usually answered correctly although an answer of 6 (3×2) was a common mistake.

Question 3. Another well answered question with few mistakes. It was pleasing to see most able to follow the correct order of operations.

Question 4. Although 10 and/or 12 were seen more often than not, a number of students failed to gain the mark by offering extra, incorrect values. 6 being the most common seen.

Question 5. Many students failed to score in this question by not simplifying the given expression fully. $3w \times 5t$ and $15 \times wt$ were popular partial simplifications gaining no marks.

Question 6. It was very pleasing to see so many students gaining good marks on this multi-step question. The vast majority gaining 2+ marks. In general, marks were lost through not reading the question carefully. Often just one child was considered, or two adults were included. Another common mistake was to omit the cost of petrol while in other cases it was seen as a cost for each person. Poor arithmetic often denied many full marks, mainly with the addition of two child tickets (the only non-integer), or with an inability to line up integers and non-integers successfully in a column addition method. Some gave the total cost of the trip instead of the change.

The standard of presentation of answers was lacking, in some cases, with little structure or order to what they were doing

Question 7. Part (a) was answered well, the vast majority clearly understanding the concept of mode. In part (b) also, understanding of probability scales and probability in general was good. In (ii), some simply added a cross to the probability scale, failing to quote the actual numerical probability; this gained no marks. Some students are still using terms such as unlikely in terms of describing probability.

Question 8. Part (a) was answered well, with very few failing to score the mark. Candidates performed less well in part (b) with many not collecting the like terms of $3n$ and n together as a first step. Many tried to subtract the n from both sides of the equation either resulting in $2n = 24$ (giving $n = 12$) or $3n = 24$ (giving $n = 8$). In this question, students usually scored no marks or full marks. Some used an embedded solution, with mixed success. Many candidates who achieved full marks did not attempt the algebraic approach and instead simply stated that $3 \times 6 + 6 = 24$, with a correct answer on the answer line.

Question 9. Part (a) was well answered with the vast majority subtracting 70 from 360 to get a correct answer of 290°. However, a great many were unable to give a correct reason for this answer in part (b). The most common incorrect explanation related to a circle "having 360°". Students need to be made aware that such an explanation is not acceptable. Many simply explained how they did it, rather than why e.g. "I subtracted 70 from 360". Students should be reminded that a calculation is not a reason.
In this case "angles at a point sum to 360°" or words to that effect is the reason required.
A common incorrect approach was to work with 180° rather than 360°.

Question 10. Most students correctly worked out that 5 was the greatest number of jars of coffee that could be bought for £23 in part (a). In part (b), a large number of candidates lost the mark as they hadn't read the question carefully enough, missing the word "exactly" in reference to the number of jars to be bought at half price. Many realised that Michael could now buy an extra 11th jar but then lost the mark because they answered 'yes' to the question "Is Michael correct?".

Question 11. Whilst many students correctly wrote down the scale factor of 2 in (a)(i), only a very small minority were able to pinpoint the centre of the enlargement in (ii). Many tried to position their centre either in between the two shaded triangles, in the centre of one of the triangles or on one (or two) of the vertices. In some cases, students who were able to draw lines to intersect at the point of enlargement identified it correctly but missed the mark because they also placed 'X' somewhere else on the graph.
In part (b)(i), accurate drawing of the mirror line was good. Whilst lines drawn with a straight edge are preferred, freehand, dotted or dashed lines were acceptable. In part (b)(ii), unfortunately, very few students were able to give the equation of their line. Common incorrect lines drawn were $x = 4$ or $y = 4$, which in some cases allowed a follow through mark if they stated this as their equation for (ii).

Question 12. Again with this multi-step problem in part (a), it was pleasing to see many students gaining good marks, often 2 or more. In this question, students had to find a sixth and 20% of 120 minutes. When performing calculations of this type it is important for students to show their working, eg $120 \div 6$ or $\frac{20}{100} \times 120$ so that credit can be awarded for correct method if errors are made with accuracy. In solving this problem, some students subtracted 50 from 120 to give 70 minutes and used this as the time spent playing badminton. Arithmetic errors were seen far too often from students when subtracting from 120.
In part (b), many ignored the good work they had done in part (a) and explained that Elana did not get to the café on time because she spent 2 hours at the sports centre making it 3.30pm when she left. This part followed through the working and answer in part (a) and the mark awarded if the reason and working were correct for the time given in (a).

Question 13. Part (a) was answered correctly by the majority of students, reading 60 from the bar chart. Part (b) was answered less well when a certain amount of extrapolation was required from the chart. 210 was a common incorrect answer.
In part (c), it was evident that many students weren't able to accurately read data from a composite bar chart, many reading the number of men as 90, women 200 and children 280 in 2020. The method mark here was awarded for sight of 80 (children) or 200 (men + women) used in a ratio. Many gained this mark but failed to score full marks as a result of incorrect values read from the chart. As a result of not reading the questions correctly, some students wrote an answer of 80 (child) : 90 (men) : 110 (women).

Question 14. Greater success was achieved in part (a) of this question by finding the sum of the distance travelled in one hour (54 miles) and the distance travelled in half an hour (27 miles). It was pleasing however, to see many students correctly quoting the equation distance = speed × time to solve this problem, although accuracy was often lost through incorrect use of the units of time. 54 × 90(mins) or 54 × 1.30 were common errors made.
In part (b), very few students were able to correctly convert from centimetres to kilometres. Many gained one mark for using the scale on the map correctly, 25 000 × 6. Credit was then given for a reasonable attempt at the conversion of 150 000 cm to km, usually just dividing by 1000. Most didn't seem to be clear that they had found a measurement in cm by multiplying by 25 000, those who did include units were more likely to be able to convert correctly as they often spotted that they could convert cm to m then m to km.

Question 15. The diagram proved very useful in getting one correct coordinate, for which one mark was awarded, usually $y = 1$, but rarely was a fully correct answer seen. Whilst many students did use the diagram, drawing the correct line segment, it was also rare to see the correct positioning of the required midpoint. This was often seen placed on the y-axis. There were very few instances of candidates using written methods to find the midpoint.

Question 16. Those students who attempted an algebraic solution often picked up good marks, 2 or more, for a correct expression for the perimeter and then equating it to the given value of 52. Simplifying their algebraic expression often proved more difficult and it was not uncommon to see quadratic terms creeping in. Some students assumed all the lengths to be the same and calculated 52/4 gaining no marks.
Some students correctly found the value of x and then failed to answer the question by finding $2x$, the length of DC. Poor arithmetic let many students down in being unable to divide 57 by 6 and hence not being able to achieve the accuracy mark.
Many students did however adopt a trial and improvement approach which usually cost them a great deal of time for little reward.

Question 17. Again, understanding of probability was good and many students gained the full 2 marks in part (a). One mark was awarded for sight of 100 – 30 (= 70) or a correct value for the probability of taking a blue counter. $\frac{3}{4}$ was a common incorrect answer by some of the less able students, assuming there was an equal number of coloured counters. Students should be reminded that expressing a probability as a ratio is not an acceptable form for this answer.
In part (b), the correct answer of 45 was the modal answer, with incorrect methods following no particular pattern. A common incorrect attempt was also to try to share 30 in the ratio 2 : 3.
Part (c) followed through student's answers in (b). Explanations were usually acceptable, such that 25 counters could not be shared equally between red and yellow. It should be noted that just saying '25 can't be divided by 2' gained no credit. Also, students should be aware that any calculations given as evidence in such questions need to be accurate.

Question 18. Many students were unable to make any progress in this question by not reading the question fully and jumping in to either find a half and/or a twelfth of 240 or to divide 240 by 5, then 3 then 2. Those that correctly divided 240 in the ratio 5 : 3 : 2 usually went on to gain good marks. Many scored 3 marks for finding the numbers of cans remaining, 120, 36 and 44 but were then unable to find the required percentage of cola cans remaining. Finding one number as a percentage of another is an area that needs addressing. Those that did find a percentage were often successful by simplifying their fraction of 120/200 to 60/100.

Question 19. The factorising of 500 was usually carried out with the aid of a factor tree diagram, many of which were seen to be fully correct. Failure to gain full marks was usually down to not giving their product of prime factors as powers as requested, often just leaving the factors in a list. Many arithmetical errors in the construction of a factor tree and some misunderstandings in the concept were seen where the sum instead of a product was given. Centres should emphasise here that complete tree diagrams should have each final branch ending in a prime

Question 20. In part (a), those students who dealt with the fractions and whole numbers separately often gained greater success in achieving full marks, although an answer of $3\frac{4}{9}$ was not uncommon.
Although no credit was given for simply converting the mixed numbers to improper fractions, many did so accurately and then were able to convert both to a common denominator with at least one correct numerator to gain one mark. However, the answer following this approach was often left as an improper fraction, $\frac{77}{20}$. Unfortunately, many just added the numerators and the denominators to give an incorrect answer of $\frac{17}{9}$.
Part (b) proved to be a much greater challenge for many students, many tried to concoct means of dividing $2\frac{2}{3}$ by 6 to get $\frac{4}{9}$, a few students however correctly changed $\frac{8}{3}$ to $\frac{24}{9}$ and divided this by 6 to get $\frac{4}{9}$. The most successful approach was $\frac{8}{3} \times \frac{1}{6}$ showing an ability to divide a fraction by a whole number. Some had success by transposing the problem to show that $\frac{4}{9}$ multiplied by 6 is equal to $2\frac{2}{3}$, although $\frac{24}{54}$ was often seen.
Many students seemed to not understand the requirements for this question.

Question 21. It was clear that the rules of indices are known by many students but the application of them was very poor. $(2^{-5} \times 2^{8})$ was often written as 4^3. This had to be carefully marked as 4^3 as a final answer was an acceptable Special Case answer for one mark.
Sometimes 2^{-10} or 2^{16} were seen but rarely both.
Less able students often unsuccessfully tried to evaluate the terms before finding a product or squaring and had little understanding of negative indices. Occasionally 2^3 was seen for the method mark but this was followed by 2^5. Working with negative numbers continues to be a problem with -5+8 being evaluated as 13 or -13. Many worked exclusively with the powers and did not include the base number at all; -5 + 8 = 3 was often seen.

Question 22. It was common to see the digits 128 quoted in the working or in an answer, but rarely was the fully correct answer of 0.00128 seen. Very few seemed to know the rule of finding the product of the numbers and then counting the decimal places in order to position the decimal point. Many used long multiplication techniques, usually to no avail. It was rare to see an answer given in standard form. Method marks were sometimes gained for arithmetic errors in working but with a correctly positioned decimal place.

Question 23. This question was not answered well at all. Sampling techniques were not well understood at this level. Many either multiplied 40 000 by 80 or divided by 15. Attempts to divide 40 000 by 80 often introduced arithmetic errors, some just left 500 as their answer and those that knew to multiply by 15 struggled to do so correctly. Some students tried to work with percentages which rarely gained any credit eg 15%.
Students need to be encouraged to consider the suitability of their answers as some offered answers which were greater than 40 000, the total number of cars produced.

Question 24. Students at this level find the comparing of ratios particularly challenging. The most common error in part (a)(i) was to add the values of *b* in the ratios to give a triple ratio of 1 : 9 : 5 or used some of the numbers in the given ratios and gave an answer of 1 : 3 : 5. Some using a correct common multiple often spoiled their final answer by more arithmetical mistakes. Although (i) was poorly answered many picked up marks for correctly following through with their values for *a*, *b* and *c* in part (ii).
In part (b), few students were able to make significant progress. Those who assigned values to *m*, *n* and *p* were often successful, but this was rare. The substitution of $n = 2m$ into $p = 5n$ was rare also but usually successful when seen. Occasionally answers lost the accuracy mark for an incorrect order of 10 : 1 or for including letters in their final answer, eg. 1n : 10n.

Question 25. This was very poorly answered. The formula and the force both being given meant there was only the need to work out the area by multiplying 4 by 2. Some students still think that when working with area, they need to square the values first before using them to divide into 10 000. Those who correctly worked out the area usually tried to divide 10 000 by 8, for one mark, but often then failed, again through poor arithmetic. Some stated the area as 6 (4 + 2) and therefore gained no credit.

Question 26. There were many trial and improvement attempts to answer part (a) of this question, the majority of which were unsuccessful, however a few did throw up the critical value of 6. Those following an algebraic approach were able to score one mark initially for a correct process to start a solution. Subtracting 3 from both sides was usually successful but multiplying both sides by 2 was often carried out incorrectly by omitting to multiply the 3 by 2 resulting in $5x + 3 > 36$ or $5x + 3 = 36$. A correct first step was often followed by an incorrect second step or no second step at all.
Replacing the inequality by an equality is not penalised but students must remember to replace the inequality for the final answer. Far too often an answer of $x = 6$ was given.
In part (b), the ability to factorise a polynomial was sketchy. Factorisation of the first two terms [eg. $x(x + 10) + 9$] was often seen but this gained no credit.
$(x + 10)(x – 1)$ was also a common incorrect answer seen. Common incorrect answers included $(x + 1x)(x + 9)$ or $(x + 9x)(x + 1)$

Summary

On the evidence of performance on this paper, students need to:

- take greater care when reading the questions. Performance in questions 6, 10b, 12 and 18 in particular was severely affected by this.
- take care when carrying out arithmetic operations and check their working to avoid careless errors.
- write clearly so that correct values quoted are not altered in subsequent working.
- show clear methods of working particularly in basic calculations such as finding fractions or percentages of quantities.
- set their working out clearly, crossing out working that is being replaced.
- be able to convert using metric units of distance.
- be clear on the specific wording required when giving geometric reasoning

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Examiners' Report

Principal Examiner Feedback

November 2023

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Non-Calculator) Paper 1F

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GCSE (9 – 1) Mathematics – 1MA1
Principal Examiner Feedback – Foundation Paper 1

Introduction

This paper provided good coverage across the specification and allowed students the opportunity to demonstrate their ability across the grades. Plenty of success was seen across the early part of the paper as students showed confidence picking up marks in the first half of the paper.

Challenges arose when questions contained a context and with it large amounts of text; extracting the key pieces of information and applying it using the correct mathematical processes are an area for improvement. Good amounts of working out were seen which certainly helped students, especially those which had arithmetic errors as part of their solution.

Question 21 onwards proved challenging for this cohort with very few students gaining full marks and the mode score being 0 marks on almost all questions. Nevertheless, the majority of questions were at least attempted in a bid to gain some credit.

For those questions requiring a written conclusion, most responses did have some sort of decision showing that students are well-accustomed to this sort of demand in a question.

Areas of the specification that need to be improved upon are highlighted in the list at the end of this report.

REPORT ON INDIVIDUAL QUESTONS

Question 1

A good number of students were able to give a correct answer of 6 but there were a significant number who did not and a wide variety of incorrect answers were given. The most common incorrect answers were 4 (from finding the median) and 5 (from finding the mean).

Question 2

This question was answered well with the majority of students able to give a correct answer of 31. Of those that didn't gain B1, 209 was the most common incorrect answer from adding instead of subtracting; 41 was also seen when students were unable to deal with the tens correctly.

Question 3

This simplifying question saw mixed results. The majority of students were able to give a correct answer of $12a$ but there were a variety of incorrect answers seen. Students should note that this

type of simplifying question requires no multiplication signs in the answer; $12 \times a$ and $3 \times 4a$ were often seen and gained no marks.

Question 4

Measuring angles is an area of the specification that needs attention. Although some students did gain a correct answer in range, with 40 most commonly seen, there were a whole range of incorrect answers given such as 35, 50 and 140.

Question 5

The majority of this cohort were able to gain B1 for a correct answer of 60. Of those that didn't, 50 and 150 were the most common incorrect answers seen.

Question 6

The majority of students gained 3 marks for an answer of 2300 on this question. For those that didn't it was an error in conversion which was often seen with 1 litre = 100 millilitres being the most common incorrect conversion used; these students could still gain 1 mark if they had a correct process to find the difference using one of the incorrect conversions stated in the mark scheme. Those students who converted 3 litres into millilitres were more successful than those who converted 700 ml into litres and errors in arithmetic were noted when doing 3000 – 700. A small number of students arrived at 2300 but spoiled their answer by then trying to convert to litres; this was still allowed if the student gave an answer of 2.3 litres but 2.3 on its own lost the A mark and this was seen on occasions. Some students also missed that the question was about 3 litres and instead subtracted 700 from 1 litre (1000 ml) obtained 300 ml and gained no marks.

Question 7

Part (a) was answered very well with the majority gaining B1 for an answer of 15. Some students found the difference between 1 and 5 and added this to 3. Part (b) saw less success with more incorrect answers seen than in (a), the most common being 10 from dividing 20 by 2 instead of 4. There were still a good proportion of the cohort who gained B1 for an answer of 4.

Question 8

Part (a) saw mixed results. A good number of students were able to find the correct frequencies for 2 marks. Many gave the correct frequencies in the tally column and something incorrect such as frequency/24 as a fraction which gained 1 mark. Some also confused the definitions of tally and frequency and put the information in the wrong column. It was encouraging to see that a number of students were crossing out items in the list as they entered their tally marks in the frequency table and were using the correct bar notation for recording the tallies. Part (b) was answered well with many gaining B1 for a correct answer; those that didn't often gave a number

for their answer instead of the correct word. Part (c) saw the full range of marks awarded with most students gaining full marks. Of those that didn't, the most common error was an incorrect linear scale, although these students could still gain 2 marks for labelling bars and correct height bars for their scales and many did. Students often struggled to correctly scale the vertical axis, sometimes writing the numbers between the squares instead of on the gridline or using multiples of 3 or 5 which often led to errors.

Question 9

For part (i) and (ii) the majority of students answered the questions correctly to gain 2 marks. Of those that didn't, giving the answer in an incorrect notation, such as ratio, was often the issue; students should be reminded that correct notation for probabilities are fractions, decimals or percentages. Some students gave an answer of $\frac{8}{22}$ for (ii), e.g. the probability for 'pink' instead of 'not pink'. In (iii) the majority of students gained B1 for a correct answer with 0 and $\frac{0}{22}$ given in equal measure. Incorrect answers generally involved incorrect notation such as 0:22 or worded answers, e.g. impossible.

Question 10

It was pleasing to see the majority of students gain 3 marks on this question. The most common process seen was to divide 60 by 20 and then multiply 250 by 3 to arrive at 750. The majority of students who reached this point also gave a positive decision to gain the full 3 marks. Some students used a 'build-down' process starting at 900 and subtracting 250 three times to deduce there would be 150 grams left. Some students attempted to find the amount needed for one cookie and go from there but this process often led to arithmetic errors. Common incorrect processes often revolved around arithmetic errors and a small number of students reached an accurate figure to compare but gave an incorrect or no decision. Some students worked with the other ingredients too but this was ignored as long as it did not contradict their final answer. A number of students believed doubling and then doubling again went from 20 to 60 rather than 80 and therefore gained no credit.

Question 11

Less than half of students in this cohort were able to gain 2 marks for a correct enlargement. Of those that didn't, the main error was in the height of the triangle and the positioning of the top vertex; most were able to gain B1 for a base of 6 cm. Some students misread the scale factor and enlarged the shape by a different scale factor – usually 2 – if done correctly B1 could still be gained.

Question 12

Part (a)(i) was answered well with most students able to gain 2 marks for an answer of 26. Of those that didn't, it was common to see incorrect algebraic expressions such as $6g + 20h$ and 23 + 45 was often seen. Part (a)(ii) saw less success with many students unable to make any progress with the substitution. Many were unsure as to which letters should be substituted for which values and substituting g for 38 was often seen. For those that did manage to show a correct substitution, some were able to rearrange correctly to reach an answer of 13. One commonly seen incorrect answer was $g = 26$. Students should be advised to write the correct answer on the answer, on occasions 13 could be seen embedded in a calculation but the wrong answer given on the answer line, leading to 0 marks. Part (b) saw mixed results as less than half of students in this cohort gained 2 marks. Of those that didn't, many gained 1 mark, usually in one of two ways; successfully working out 3×-3 as -9 but being unable to accurately subtract 2 or for a full substitution; common incorrect answers included -7, 7 and 11. Some students wrote notes saying 2 negatives make a positive, leading to the misconception that the negative for the 9 and the subtraction sign meant the two values needed to be added, leading to an answer of 11.

Question 13

This question saw the full range of marks awarded. Some students were able to work through the process to reach an answer of 23p or £0.23. Of those that didn't, it was common to see 2 or 3 marks awarded, in particular for students who reached 160 or 460 but could go no further. Those that earned 3 marks gave a complete process with arithmetic errors in the process. It is encouraging to see that more students are fully demonstrating their method enabling them to gain marks despite their final answer being incorrect. Centres should continue to encourage their students to set out their working in a logical order so that they can access Method and Process marks. Some students dealt with the information and started the process incorrectly such as $100 \div 3$ or started correctly e.g. $100 \div 5$ but went wrong after that such as 20 + 8 and an answer of 28p. Some students incorrectly divided £3 by 5 following their process of dividing 100 by 5, resulting in an answer of 60p or 68p (after adding 8p) whereas others mixed up units within their working, e.g. 300/100 = 3g instead of 3p.

Question 14

This question saw the full range of marks awarded. Of those students who managed to plot the correct 5 points it was usual to see this accompanied by a straight line through the points. Some students gained 2 marks, usually for a line segment through 3 correct points; students should be able to recognise that an equation of the form $y = mx + c$ produces a straight line and therefore if one point is not in line with the others it will likely be incorrect. Some students gained 1 mark for producing 2 correct points either plotted or stated in the workspace but there were difficulties in calculating y when x was negative. More than half of the cohort gained 0 marks so this is an area of the specification that needs to be worked on.

Question 15

This question saw the full range of marks awarded. The majority of the cohort made a good start with a process to find 25% of 12,000. It was common to see students using the build-up method to work out percentages of amounts but this alone could not be credited with method or process marks if arithmetic errors were made and the process is not complete e.g. all steps seen such as 10% = 12,000 ÷ 10 = 1,200. Many then picked up the 2nd process mark for subtracting the deposit from 12,000 and also the 3rd for a complete process. It was common to see the accuracy mark not gained as students were unable to carry out the arithmetic for the division; 405 and 45 were commonly seen incorrect answers. Some students were not able to gain the first P mark but were able to gain the second and third P mark for a correct process using their deposit value and this was often seen. 12,000 was often misread as 1,200.

Question 16

Around two thirds of this cohort were able to gain 2 marks by reaching a value to show that Shah had passed the exam, usually 42 or 75(%). Some students had a correct method but could not carry it out accurately. Others were not able to gain any marks as they set up a fraction such as $\frac{45}{60}$ but were not able to go any further. Some students reached 42 or 75 but failed to interpret the results correctly, often saying that Shah did not pass the exam.

Question 17

The majority of students were able to gain at least 1 mark for correctly inverting the second fraction and multiplying. It was common to see the second mark gained too, usually for reaching $\frac{18}{5}$. Students who attempted to find a common denominator, e.g. $\frac{18}{30} \div \frac{5}{30}$ often made no further progress. The final step proved to be the most challenging for this cohort but some were able to successfully convert to a mixed number. Students should read the demand of the question carefully as 3.6 given as an answer was seen.

Question 18

The majority of students opted to use column multiplication for this arithmetic question. Some students managed correct place value in their structure and a good number of those managed to reach the digits 1512 to gain the first accuracy mark and place the decimal point correctly to the gain the full 3 marks. Common errors seen were incorrect place value in the columns, as well as incorrect arithmetic when adding the columns, usually arriving at the digits 378 or in trying to break down the components but only using 6 × 2 and 0.3 × 0.4, giving an answer of 13.2. Some students reached 1512 but were unable to place the decimal point in the correct place; centres need to continue to encourage students to use approximation to decide on a sensible place for their decimal point.

Question 19

It was rare to see a correct answer in (a)(i) with incorrect answers of 0 and 5 seen often. (a)(ii) also saw little success with the majority of students gaining B0; common incorrect answers included 0.05, −10 and −25. Part (b) saw mixed results, some students were able to make a correct first step, usually adding the powers for the numerator to reach 2^9. From there students either went onto gain 2 marks for a correct answer or incorrectly simplified, with $2^9 \div 2^3 = 2^3$ most commonly seen. A good proportion of the cohort gained no marks, making an incorrect first step such as $2^5 \times 2^4 = 4^9$ or $2^5 \times 2^4 = 2^{20}$. Some students also evaluated the terms as ordinary numbers and worked from there; if 64 was reached this gained M1 and was seen regularly.

Question 20

Part (a) saw most students make a good attempt at a factor tree. A good number of students were able to complete their factor tree accurately and also write their prime factors as a product. The factor tree was attempted by most students and well set out. There was a good understanding of the need for prime factors and very few included 1. Of those that did not gain 2 marks, common errors included incorrectly considering 39 as a prime number and arithmetic errors when considering the next pair of prime factors. For part (b) it was more common to see 1 mark gained rather than 2. Students were able to produce either the prime factors of 130, at least 4 factors of 156 or 130 or a common factor of 156 and 130. Of those students who gained no marks, finding the lowest common multiple was the most commonly seen incorrect method.

Question 21

Part (a) saw the full range of marks awarded. Some students completed a fully correct process to reach an answer of 3.5 or equivalent. Of those that didn't, some reached as far as $14 \div 4$ but could not follow the process through with 3.2 quite often seen as the result of the division; students and centres should note that $\frac{14}{4}$ gained full marks. Some students were able to find the total length of the 5 sticks but made no further progress. There were also a good number who did not manage to make a correct first step and gained 0 marks; a common error was to calculate 4×7 or 4×4.2 rather than 5×4.2. Part (b) saw little success as most students gained no marks, with common incorrect responses centring around the mean increasing or the length of the other 4 sticks being reduced.

Question 22

It was rare to see a fully correct construction and 90° angle at *P* on this question. Almost all students on this paper did not know what arcs were required. Many students did however gain 1 mark for drawing a 90° angle at *P* without the correct construction lines.

Question 23

Very few students were able to gain full marks on this question. A small number made a positive start and gained one of the first two P marks, the equations most commonly seen were $x = 2y$, $2x + y = 180$ and $y + w = 180$. Division by 3, rather than 5, of the 180° in the triangle was commonly seen. Most students understood the correct angle facts for angles in a triangle / on a straight line. Many students ignored the fact the triangle was isosceles and calculated the angles as if it was an equilateral triangle, giving 60° angles which led to $180 - 60 = 120$ as the incorrect answer. Many students attempted to assign values to x and y, these values were usually incorrect but if the correct values were seen this usually led to a correct value for w as well.

Question 24

This was another challenging multi-step question for this cohort; the majority gained 0 marks. Some were able to make a correct start and set up an equation in x, although some failed to include the x from shelf **A**. Progress from there required a correct process to solve their equation and substitute the value for x into one of the expressions for shelves **B** or **C**, any students that did this successfully often gained the 3rd P mark as well for 7500 ÷ "25". It was rare to see any students get as far as the 4th P mark but those that did usually went on to gain full marks assuming their arithmetic had been correct. There were many completely incorrect solutions seen such as expanding $(3x + 1)(2x - 5)$ or setting $3x + 1$ equal to 7500 and going from there.

Question 25

Those that knew the density, mass, volume formula generally scored 2 marks. Of those that did not gain 2 marks, most scored 0 for incorrect use of mass and volume, with the most common error being to multiply 27 and 10 instead of divide. Other incorrect methods involved trying a volume unit conversion, confusing units^3 with 10^3 and dividing 27 by 1000, and being unable to choose between m/v and $m \times v$ and stating both.

Question 26

It was common to see students gain the first method mark for rounding one of the figures appropriately, 6 or 8 on the numerator being seen most often. The majority then struggled with the next step which was to carry out an accurate calculation. Some were able to reach the digits 16, from attempting 48 ÷ 0.3 but resulting in incorrect place value. Some students attempted to work out the accurate calculation and then round the answer, gaining no marks. A few students were able to deal with the decimal value of 0.3 in the denominator by multiplying both the top and bottom of their fraction by 10. This is a useful skill for centres to continue teaching their students but in general dividing by decimals is a skill that needs more practice. Some students rounded 0.26 down to 0 which led to 48 ÷ 0 and were confused with what to do with the calculation.

Question 27

For part (a) there were many good attempts to expand the brackets but these attempts rarely resulted in credit being awarded. Common errors included $6x$ or $5x$ instead of $6x^2$ and incorrect signs being used. Those students using the grid method to expand the quadratic were usually successful at gaining at least 1 mark. In part (b) a small number of students were able to give a correct factorisation. Some students who gained B0 were able to give a pair of brackets with the product of the constants being −16, such as $(x + 2)(x – 8)$.

Summary

Based on the performance on this paper, students/centres should work on:

- measuring angles accurately.
- improving numeracy skills, including division skills for integers and decimals, multiplication skills for decimals.
- the interpretation of problems involving ratio.
- the formation of algebraic equations and solving them along with subsequent substitution to apply to problems in context.
- drawing a straight line graph by correctly calculating a table of values.
- using equilateral, isosceles and right-angled triangles to solve angle questions.
- encouraging students to show a full method for percentage calculation, noting that before method marks can be awarded a full explanation of each step has to be shown. If the answer is just stated then process marks will be lost if there are any arithmetic errors.
- encouraging students to set out their working using logical steps.
- encouraging students to read the question carefully so that they understand what they are required to do and what format the answer should be stated in.
- encouraging students to use approximations to check if their answers are sensible.
- encouraging students to set their work out in an orderly fashion.
- improving the expertise and accuracy required in geometric constructions.

and

- in questions requiring finding the prime factors of a number, encourage a more structured approach of dividing the number by the smallest prime numbers successively until the result was a prime number.
- ensure students know common metric equivalents from the specification, from one unit to another.
- practise arithmetic processes involving negative numbers.

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