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GCSE MATHS

Statistics

Edexcel 1MA1 | Subtopic collection Topic 60

Scatter graphs and correlation

Foundation tier

Answers and examiner comments

27	2011-2024	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
15 (a)		Point at (11.5, 73)	1	B1 Point plotted $\pm \frac{1}{2}$ small square
(b)			1	B1 for description of dynamic relationship eg "the more hours of sunshine, the more ice creams sold" or positive correlation [Note: 'sunnier' implies 'more hours of sunshine']
(c)		62 - 70	2	B2 for answer in the range 62-70 OR M1 for a single straight line of best fit with positive gradient, passing between (6.5, 45), (6.5, 59) and (12, 70), (12, 80) or a vertical line drawn from 10 A1 for answer in range 62-70 or ft from single straight "line of best fit" with positive gradient

Question	Working	Answer	Mark	Notes
12 (a)	See scatter graph	(12, 14) and (17,20) plotted	1	B1 for correct plotting of both points
(b)			1	B1 Positive
(c)		16 to 18	2	B2 16-18 or M1 for a single line segment from m=11 to m=16 within overlay A1 ft their line of best fit (±) 2mm

14	(a)		Points plotted	1	B1 points plotted (180,72) and (170,65) ±2mm
	(b)		Positive	1	B1 positive (correlation) cao
	(c)		Line of best fit	1	B1 line passing between (140,40)(140,55) and between (185,60)(185,75) with a positive gradient
	(d)		52-60	1	B1 within the range 52-60 or ft a single straight line segment with positive gradient.

5MB1F_01

Question		Working	Answer	Mark	Notes
26	(a)		negative	1	B1 for negative
	(b)		10.3 - 11.7	2	M1 for a single straight line segment with negative gradient that could be used as a line of best fit **or** an indication on the diagram from 2.5 on the *x* axis A1 for an answer in the range 10.3 – 11.7 inclusive
*27		(17–2.8)×9.5 =134.9 $\pi\times(3.8\div2)^2$ =11.34.. 134.9 – 2×11.34 =112.21 112.21 ÷ 25 = 4.488	5	5	M1 for (17–2.8)×9.5 (=134.9) or 17×9.5– 2.8×9.5 (=161.5 - 26.6 = 134.9) M1 for $\pi\times(3.8\div2)^2$ (=11.33 – 11.35) M1(dep on M1) for '134.9' – 2×'11.34' A1 for 112 - 113 C1(dep on at least M1) for 'He needs 5 boxes' ft from candidate's calculation rounded up to the next integer.

<table>
<tr><th colspan="5">1MA0_2F</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>*28</td><td></td><td>180 × 365 =65700
65700÷1000 =65.7
65.7×91.22 =5993.154
5993.154÷100 + 28.20= 88.13..

<table><tr><td>D</td><td>U</td><td>C</td><td>T</td></tr><tr><td>366</td><td>65880</td><td>6010</td><td>88.30</td></tr><tr><td>365</td><td>65700</td><td>5993</td><td>88.13</td></tr><tr><td></td><td>65000</td><td>5929</td><td>87.49</td></tr><tr><td></td><td>66000</td><td>6020</td><td>88.40</td></tr><tr><td>364</td><td>65520</td><td>5976</td><td>87.96</td></tr><tr><td>360</td><td>64800</td><td>5911</td><td>87.31</td></tr><tr><td>~~336~~</td><td>~~60480~~</td><td>5517</td><td>83.37</td></tr></table></td><td>Decision (Should have a water meter installed)</td><td>5</td><td>Per year
M1 for 180 × ‘365’ (=65700)
M1 for “65700”÷1000 (=65.7 or 65 or 66)
M1 for “65.7”×91.22 (=5993.....)
A1 for answer in range (£)87 – (£)89
C1(dep on at least M1) for conclusion following from working seen

OR (per day)
M1 for 107 ÷ ‘365’ (=0.293…)
M1 for 180 ÷ 1000 × 91.22 (=16.4196)
M1 for 28.2 ÷ ‘365’ + ‘0.164196’ (units must be consistent)
A1 for 29 – 30(p) and 24– 24.3(p) oe
C1(dep on at least M1) for conclusion following from working seen

OR
M1 for (107 – 28.20) ÷ 0.9122 (=86.384..)
M1 for ’86.384..’×1000 (=86384.5…)
M1 for ‘365’ × 180 (=65700)
A1 for 65700 and 86384.5..
C1(dep on at least M1) for conclusion following from working seen

NB : Allow 365 or 366 or 52×7 (=364) or 12 × 30 (=360) or 365¼ for number of days</td></tr>
</table>

12	(a)		(5, 300) plotted	1	B1 for point plotted at (5, 300) allow ± ½ square tolerance
	(b)		The greater the age the less the value	1	B1 for the greater the age the less the value (price, cost etc.) Accept negative correlation but "negative" or "negative relationship" gets B0
	(c)		500 to 800 inc.	2	B2 for an answer in the range 500 to 800 (inc.) OR M1 for a single straight line segment with negative gradient that could be used as a line of best fit A1 ft from their line of best fit [SC: B1 ft reading from their single straight line with negative gradient at Age = 4 if M0 scored]

5MB1F_01

24	(a)		Positive (correlation)	1	B1 for positive (correlation) [do not accept a relationship]
	(b)		83 to 87 inc.	2	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

15	(a)		positive	1	B1 Accept with 'positive' valid extra words eg strong positive
	(b)		46 – 54	2	B2 46 – 54 Or M1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 44 A1 for given answer in the range 46 – 54

5MB1F_01

Original question 13

The full source mark scheme begins on page 40. Use the original paper code, tier and question number shown above.

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
25	(a)		Points plotted	1	B1 for points plotted at (12, 6) and (13, 2)
	(b)		Description	1	B1 for description; e.g. as the temperature goes up the number of units of gas used goes down oe accept negative correlation.
	(c)		5 – 7	2	M1 for use of graph e.g. a single straight line segment with negative gradient that could be used as a line of best fit **or** an indication on the diagram from 12 on the *y* axis. A1 for 5 – 7

Paper_5MB1F_01

Question		Working	Answer	Mark	Notes
14	(a)		Point plotted	1	B1 for point plotted at (6,35)
	(b)			1	B1 for description of dynamic relationship eg “the lower the temperature, the more hot chocolate sold” or negative correlation
	(c)			1	Single straight line of best fit which could be used to take readings
	(d)		21-26	1	B1 for answer in the range 21-26 or ft from single straight line segment (if previous B0)

17		1½cm grid. Inside measurements of squares are 1.4 cm. Crosses changed to filled in circles. Right axis labelled	

21	(a)		Relationship	1	B1 for description of relationship eg "As the length of the pine cone increases the width increases" oe (accept positive correlation)
	(b)		6.1 to 6.4	2	M1 for a single straight line segment with positive gradient that could be used as a line of best fit or a vertical line from 8.4 or a point at (8.4, *y*) where *y* is from 6.1 to 6.4 A1 for given answer in the range 6.1 to 6.4

PAPER: 1MA0_2F

Original question 25

The full source mark scheme begins on page 52. Use the original paper code, tier and question number shown above.

Question	Working	Answer	Mark	Notes
12 (a)		Description	1	B1 description eg Taller trees are older. Accept positive correlation
(b)		20	1	B1 19 – 21
(c)		2	2	M1 for evidence of taking readings at two points from Sandy line, or increase excluding start e.g. 24 ÷ 10 or 14 ÷ 5 A1 for answer 1.8 to 2.2

PAPER: 1MA0_2F

Question		Working	Answer	Mark	Notes
22	(a)		Point plotted	1	B1 cao
	(b)		positive	1	B1 cao
	(c)		18 - 22	2	M1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 10 or a point plotted at (10, *y*) where *y* is in the range 18 - 22 A1 18 - 22
	(d)		45	1	B1 cao

Original question 14

The full source mark scheme begins on page 74. Use the original paper code, tier and question number shown above.

PAPER: 5MB1F/01

Question		Working	Answer	Mark	Notes
14	(a)		Point plotted	1	B1 for point plotted at (8.5, 35)
	(b)		Positive	1	B1 for positive
	(c)		40 - 50	2	M1 for suitable line of best fit drawn or evidence of vertical line at 10 or a point indicated at $(10, y)$ where $40 \leq y \leq 50$ A1 for 40 – 50

14	(a)		The greater the hand length the greater the foot length	1	B1 for the greater the hand length the greater the foot length oe (accept positive correlation)
	(b)		24 – 25	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 18.5 on the *x*-axis A1 for answer in range 24 – 25

PAPER: 5MB1F_01

25	(a)		positive	1	B1 cao
	(b)		17 – 21.5	2	M1 for a single line segment with positive gradient that could be used as a line of best fit or a horizontal line from 21 or a point plotted at (x, 21) where x is in the range 17 – 21.5 A1 for answer in range 17 – 21.5

Question	Working	Answer	Mark	Notes
21 (a)		10,19	B1	cao
(b)		Positive	C1	positive (correlation)
(c)		12 to 13	M1	for an appropriate line of best fit drawn, or a point marked at (x, 16.4) or a horizontal line drawn from 16.4 across to (x, 16.4) where x is in the range 12 to 13
			A1	hours given in the range 12 to 13
(d)		explanation	C1	(yes) e.g. as the majority of points for high temperature appear when there are more hours of sunshine (positive correlation)

Question	Answer	Mark	Mark scheme	Additional guidance
19 (a)	negative	B1	cao	Ignore any description of a relationship and any reference to strength of correlation
(b)	Explanation	C1	for a correct explanation, eg “not in line with the trend of the other points” “does not fit in with the correlation” “is far away from the other points or line of best fit”	
(c)	Comment	C1	for an explanation eg “point would be outside of the range of the scatter diagram”	

21	statements	C1	for lobf incorrect **Acceptable examples** lobf lobf does not suit all points/not a lobf lobf wrong since hits *x* axis/is inaccurate/should be amongst the crosses lobf goes through the origin/through one point **Not acceptable examples** no correlation/there is no title	
		C1	for height scale not linear **Acceptable examples** 150 missing Height not linear / Height numbers going up wrong **Not acceptable examples** 150 graph does not start at 140/graph does not start at 0 height should start at 170	

Paper: 1MA1/2F

24	35 to 42	M1 A1	for drawing a suitable line of best fit **or** for a line from $x = 34$ **or** for a point marked on the grid at (34, y), y in the range 33 to 44 answer in the range 35 to 42	Line at $x = 34$ does not have to be full length of grid but should be in or reach the data set. Acceptable values for the data set are $y = 33$ to $y = 44$

Paper: 1MA1/3F

21	(a)	(100,18)	B1	cao	
	(b)	12.8 to 14.8	M1	for a method to read off eg line of best fit **or** line up from 370 **or** for a point on the grid at (370, *y*) where *y* lies between 12.8 and 14.8	
			A1	for an answer in the range 12.8 to 14.8	
	(c)	Decision and statement	C1	for decision and statement **Acceptable examples** No, as this point can be disregarded from the general trend No, ignore this point No, the correlation is positive No, because even with an outlier you can still have a negative or positive correlation. No, there is still a correlation. No, as you can use the rest of the data to determine a correlation. No, as outlier does not affect the majority No as a line of best fit can still be drawn No, it is an anomaly **Not acceptable examples** Yes, …. Outliers can be ignored [no decision] No, the outlier can be ignored so the correlation is negative No there are other things that can affect the test	

Paper: 1MA1/3F

18	(a)	(2, 1)	B1	cao	
	(b)	Description	C1	correct description, eg as the amount of rainfall decreases the number of hours of sunshine increases	Accept negative correlation Ignore any comment about strength Any numbers used in the description must be within tolerance
	(c)	3 to 4	M1	for a suitable line of best fit drawn, **or** for a point marked at (x, 7), **or** a horizontal line drawn from 7 across to (x, 7) where x is in the range 2.5 to 4	
			A1	answer in the range 3 to 4	

Paper: 1MA1/2F

Question	Answer	Mark	Mark scheme	Additional guidance
25 (a)	Description	C1	for a valid description of the relationship **Acceptable examples** As age increases, weight increases The older you are the greater the weight Positive correlation **Not acceptable examples** Positive (relationship) age and weight are in proportion strong correlation or correlation is increasing as the babies get older the heavier they get, negative correlation they are directly proportional, weight goes up as age goes up	Accept positive correlation Ignore any comment about strength
(b)	2.5 to 4.5	B2	for an answer in the range 2.5 to 4.5	
		(B1	for a suitable line of best fit drawn **or** for a point on the grid at (x, 5.8) where x lies between 2.5 and 4.5 **or** a horizontal line drawn from 5.8 across to (x, 5.8) where x is in the range 2.5 to 4.5)	

21	(a)	positive	C1	cao	Ignore any description of a relationship and any reference to strength of correlation
	(b)	lobf drawn	C1	for straight line passing between (140, 20) and (140, 22.5) and between (220, 30) and (220, 32.5)	
	(c)	26.5 to 29.5	C1	for answer in range 26.5 – 29.5 **or** ft single line with positive gradient	

Paper: 1MA1/2F

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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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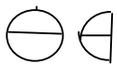
PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		24	1	B1 cao
	(b)		22	2	M1 for 8 + 8 + 6 oe or "24" − 2 A1 cao
	(c)			1	B1 for drawing a circle showing 4 quadrants and a semicircle showing 2 sectors
2	(a)		evens	1	B1 cao
	(b)		unlikely	1	B1 cao
	(c)		1 marked	1	B1 for cross 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.

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$\frac{1}{4}$

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)	4 | **15** | **11** | **30** **12** | 5 | **10** | 27 **16** | 20 | 21 | 57	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

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:			
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)

Summer 2015

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

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PMT

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.

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.

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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.
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 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.

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

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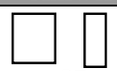
PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)			1	B1 for 6 TVs drawn for Sunday
	(b)		37	2	M1 for attempt to find the total for 4 days (eg 8+10+13+6) by adding individual days with at least 3 days correct A1 cao
2	(a)		50	1	B1 cao
	(b)		$\frac{3}{8}$	1	B1 cao
	(c)		2 squares shaded	1	B1 cao
	(d)		$\frac{2}{8}$ and $\frac{5}{20}$	2	B2 for both correct (B1 for one correct)
3	(a)		37.4	1	B1 cao
	(b)		6500	2	M1 for sight of 3500 or attempt to count up from 3500 on scale or count down from 10000 on scale or 10000 – "3500" ["3500" in the range 3000 – 4000] or an answer which includes the digits 65 A1 cao
4	(a)		Gulf	1	B1 cao
	(b)		Avris	1	B1 cao
	(c)		19 200	1	B1 cao

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PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)		Parallel lines marked	1	B1 for parallel lines marked
	(b)		Right angle	1	B1 for right angle marked
	(c)		35	1	B1 for 33 - 37
6	(a)		11	1	B1 cao
	(b)		+ 8 or × 3	1	B1 for + 8 or × 3
7	(a)		08 12	1	B1 cao
	(b)		6	2	M1 for evidence of counting on 15 minutes from 09 20, could be shown with table A1 cao
	(c)		17 35	1	B1 cao
8	(a)(i)		likely	2	B1 cao
	(ii)		Mark at 0		B1 cao
	(b)		Mark at $\frac{1}{2}$	1	B1 cao
	(c)	(1, H), (2, H), (3, H), (4, H), (5, H); (6, H), (1, T), (2, T), (3, T), (4, T), (5, T), (6, T)	combinations shown	2	M1 for at least 4 correct outcomes A1 for all 12 correct outcomes with no incorrect outcomes and no repeats

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PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)		4.40	3	M1 for a method to find the cost for one delivery method eg 19 + 7 × 0.7(0) (= 23.9(0)) or 16 + 7 × 0.5(0) (= 19.5(0)) M1 for a method to find the cost for **both** delivery methods **and** attempting to subtract eg 23.90 – 19.50 A1 cao Accept 4.4 **OR** M1 for method to find the difference between the two delivery costs eg 19−16 (=3) and 70-50 (=20) M1 for a method to find the "cost" using the differences eg "3" + 7 × "20" A1 cao Accept 4.4
	(b)		23	3	M1 for 25 – 16 (= 9) M1 for a method to divide "9" by 0.50 (= 18) A1 cao **OR** M1 for starting with 16 and a method to add on 0.50s M1 for starting with 16 and adding on 0.50s to within 0.50 of 25 A1 cao
10	(a)		5.8 to 6	1	B1 for an answer in the range 5.8 to 6
	*(b)		No (supported)	3	M1 for a correct conversion of any amount (lb to kg or kg to lb) excepting that in (a) M1 (dep M1) for a complete method to convert 100 kg (from 25×4) to lb (to compare with 200 lb) or to convert 50 lb (from 200÷4) to kg (to compare with 25 kg) C1 for "no" and a comparison with a converted weight of 212 - 228 pounds or 88 - 94 kg

<table>
<tr><th colspan="6">PAPER: 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>11</td><td>(a)</td><td></td><td>2, 1</td><td>1</td><td>B1 cao</td></tr>
<tr><td></td><td>(b)</td><td></td><td>–2, 3</td><td>1</td><td>B1 cao</td></tr>
<tr><td></td><td>(c)</td><td></td><td>Point marked</td><td>1</td><td>B1 for point marked at (–3, –1)</td></tr>
<tr><td></td><td>(d)</td><td></td><td>Line $x = 3$ drawn</td><td>1</td><td>B1 for line $x = 3$ drawn</td></tr>
<tr><td>12</td><td></td><td></td><td>13
−1
13
26</td><td>4</td><td>B1 cao
B1 cao
B1 cao
B1 cao
SC: If B0 scored award M1 for appropriate working shown</td></tr>
<tr><td>13</td><td>(a)</td><td></td><td>9</td><td>1</td><td>B1 cao</td></tr>
<tr><td></td><td>(b)</td><td></td><td>50</td><td>1</td><td>B1 cao</td></tr>
<tr><td>*14</td><td></td><td>
<table>
<tr><td colspan="2">g</td><td colspan="2">kg</td></tr>
<tr><td>2000</td><td>600</td><td>2</td><td>0.6</td></tr>
<tr><td colspan="2">mm</td><td colspan="2">cm</td></tr>
<tr><td>400</td><td>450</td><td>40</td><td>45</td></tr>
<tr><td>210</td><td>350</td><td>21</td><td>35</td></tr>
<tr><td>75</td><td>80</td><td>7.5</td><td>8</td></tr>
</table>
</td><td>Yes with correct conversions</td><td>4</td><td>M1 for using 1 kg = 1000 g eg sight of 2000 or 0.6
M1 for using 1 cm = 10 mm eg sight of 400, 210, 25, 45, 35 or 8
M1 for evidence of considering three boxes eg 2.5×3 (=7.5) or reducing the 2kg parcel to compare with one box
C1 for “yes” with correct conversions of dimensions and weight
NB: Candidates can work in cm or in mm and in kg or g</td></tr>
<tr><td>15</td><td>(a)</td><td></td><td>1</td><td>1</td><td>B1 cao</td></tr>
<tr><td></td><td>(b)</td><td></td><td>54</td><td>2</td><td>M1 fx (at least 3 seen from 0×2, 1×12, 2×8, 3×6, 4×2) or for an answer of 56
A1 cao</td></tr>
</table>

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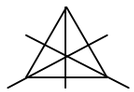
PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
16	(a)			2	M1 for any 1 correct line of symmetry, allow extras A1 for all 3 lines and no extras
	(b)		Triangle drawn	2	M1 for intersecting arcs of radii 6cm or an accurate triangle with no arcs A1 for a fully correct triangle with arcs
	(c)		48	2	M1 for 24 ÷ 3 (=8) A1 cao
	(d)		Tessellation	2	B2 for correct tessellation (at least 5 more shapes) (B1 for at least 4 shapes, including initial shape, correctly tessellating)
17	(a)		–7	2	M1 for 2 × 4 + 3 × –5 or 8 – 15 oe A1 cao
	(b)		36	1	B1 cao
*18			x =115° with complete reasons	3	M1 for angle CEB = 180 – 25 – 90 (= 65) or angle ABE = 90 – 25 (= 65) or for x = 25 + 90 A1 for 115 C1 (dep on M1) for full reasons, appropriate to their given method e.g. angles in a triangle add up to 180° **and** angles on a straight line add up to 180° e.g. the exterior angle of a triangle is equal to the sum of the interior opposite angles e.g. angles in a quadrilateral add up to 360° e.g. alternate angles are equal

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)		16	2	M1 for 360 ÷ 45 oe or 2 × 8 or Roach identified as 6 or Bream identified as 8 A1 cao
	(b)		No	1	B1 for 'No' and correct explanation, e.g. the pie charts only show that the proportions OR explains that she could be correct if the total number of fish is the same in each chart OR explains that we don't know if she is correct because the total number of fish is not known.
20			18	3	M1 for $\frac{1}{10} \times 60$ (= 6) or $\frac{1}{10} + \frac{3}{5}$ or "$\frac{7}{10}$" oe M1 for $\frac{3}{5} \times 60$ (= 36) or 1 – "$\frac{7}{10}$" (=$\frac{3}{10}$) or "$\frac{7}{10}$"× 60 (= 42) A1 cao
21			12	3	M1 for a method to find volume of a cuboid, eg. 2 × 10 × 15 (= 300) or 5 × 5 × x (= 25x) M1 (dep) for "300" ÷ "25" oe A1 cao OR M1 for 10 ÷5 (= 2) and 15 ÷ 5 (= 3) or 10 ÷5 (= 2) and 2 ÷ 5 (= 0.4) M1 (dep) for 2 × "2" × "3" or 15 × "2" × "0.4" A1 cao

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
22			Question	2	B1 for a question with a time frame for frequency of use B1 for at least 3 correctly labelled response boxes (non-overlapping and exhaustive) [Do not allow inequalities in response boxes]
23	(a)		$2(4x + 3)$	1	B1 cao
	(b)		$y(y - 2)$	1	B1 cao
	(c)		p^5	2	M1 for $\frac{p^{3+4}}{p^2}\left(=\frac{p^7}{p^2}\right)$ or $p^{3-2} \times p^4$ $(= p^1 \times p^4)$ or $p^3 \times p^{4-2}$ $(= p^3 \times p^2)$ A1 cao

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PAPER: 1MA0_1F

Question		Working	Answer	Mark	Notes
*24		1195 4780 5975 2 3 9 0 4 | 0 6 | 1 8 | 2 5 1 0 | 1 5 | 4 5 | 5 9 7 5 | | 200 | 30 | 9 | | 20 | 4000 | 600 | 180 | | 5 | 1000 | 150 | 45 | 4000 + 1000 + 600 + 150 + 180 + 45 = 5975	Kirsty's Plants with correct calculations	5	M1 for complete method with relative place value correct. Condone 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation or digits 5975 M1 for a complete method to find 120% of £52.50 A1 for 59.75 and 63(.00) C1 (dep on M2) for correct conclusion for their figures OR M1 for the start of a method to divide £52.50 by 25, eg. 2 rem 2 M1 for a complete method to divide £52.50 by 25, condone one arithmetic error, or digits 21 M1 for a complete method to find 120% of "£2.10" A1 for 2.52 C1 (dep on M2) for correct conclusion for their figures OR M1 for a complete method to find 120% of £52.50 M1 for the start of a method to divide "63" by 25, eg. 2 rem 13 M1 for a complete method to divide "63" by 25, condone one arithmetic error, or digits 252 A1 for 2.52 C1 (dep on M2) for correct conclusion for their figures
25	(a)		Relationship	1	B1 for a description of a dynamic relationship eg "The older the car the lower the price" or "The newer the car the greater the price" oe (accept negative correlation)
	(b)		6400 to 7000	2	B2 for an answer in the range 6400 to 7000 OR M1 for a single straight line segment with negative gradient that could be used as a line of best fit or vert. line from 3.5 or a point plotted at (3.5, *y*), *y* in the range 6400 to 7000 A1 for 6400 to 7000

PMT

PAPER: 1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
26		40, 80, 120 15, 30, 45, 60, 75, 90, 105, 120 40 = 2 × 2 × 2 × 5 15 = 3 × 5	3 and 8 or any multiple of 3, 8	3	M1 for multiples of both 40 and 15 (at least 2 of each shown but condone errors if intention is clear) or 40 × 15 M1 (dep on M1) for a complete method to find a common multiple of 40 and 15, eg sight of 120, 240, 600, condoning one arithmetic error in any lists of multiples shown A1 for 3, 8 or any multiple of 3, 8 **OR** M1 for factors 2,2,2,5 and factors 3,5 M1 (dep on M1) for a complete method to find a common multiple of 40 and 15 A1 for 3, 8 or any multiple of 3, 8
*27			Has enough (with evidence)	5	M1 for splitting the shape (or showing recognition of the "absent" triangles) and using a method to find the area of one shape M1 for a complete method to find the total area, (= 9 m^2) M1 (dep M1) for a method to find the number of packs required from their total area, eg. "9" ÷ 2 = 4.5 rounded up to 5 M1 for a method to find 75% of 24.80 or 75% of the cost of their total number of packs, eg. 24.80 × 5 × $\frac{75}{100}$ (= 93) or 24.80 × $\frac{75}{100}$ (= 18.6) C1 for a conclusion supported by fully correct answers, eg. showing 9 (m^2), 5 (packs) and 93 or 7 (from 100 – 93) **OR** M1 for method to find 75% of £24.80, eg. 24.80 × $\frac{75}{100}$ (= 18.6) M1 for method to find total number of packs Mary can buy, eg. 100 ÷ "18.60" = 5.3.... truncated to 5 or 10 (m^2) M1 for finding area of one relevant shape or showing how one pack (2 m^2) can fit in the diagram M1 (dep on previous M1) for complete method to show that 5 packs can cover the floor C1 for a conclusion supported by fully correct answers, showing the capacity (10) greater than total area (9)

PMT

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**
Q1	(a)	Diagram enlarged. The key has been moved above the diagram. Braille only: rectangle has been divided into 4 in the diagram.	B1 for 6 TVs drawn for Sunday
Q1	(b)	Diagram enlarged. The key has been moved above the diagram. Braille only: rectangle has been divided into 4 in the diagram.	M1 for attempt to find the total for 4 days (eg 8+10+13+6) by adding individual days with at least 3 days correct A1 cao
Q2	(a)	All diagrams enlarged. Shading changed to dotty shading.	B1 cao
Q2	(b)	All diagrams enlarged. Shading changed to dotty shading.	B1 cao
Q2	(c)	All diagrams enlarged. Shading changed to dotty shading.	B1 cao
Q2	(d)	All diagrams enlarged. Shading changed to dotty shading. 'some' replaced by 'five'.	B2 for both correct (B1 for one correct)

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PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
Q3	(a)	All diagrams enlarged.	B1 cao
Q3	(b)	All diagrams enlarged.	M1 for sight of 3500 or attempt to count up from 3500 on scale or count down from 10000 on scale or 10000 – "3500" ["3500" in the range 3000 – 4000] or an answer which includes the digits 65 A1 cao
Q4	(a)	Final column removed from the table.	B1 cao
Q4	(b)	Final column removed from the table.	B1 cao
Q4	(c)	Final column removed from the table.	B1 cao
Q5	(a)	Diagram enlarged. Angle arc put inside the angle size.	B1 for parallel lines marked
Q5	(b)	Diagram enlarged. Angle arc put inside the angle size.	B1 for right angle marked
Q5	(c)	Diagram enlarged. Angle arc put inside the angle size.	B1 for 33 - 37
Q6	(a)	Diagrams enlarged.	B1 cao
Q6	(b)	Diagrams enlarged. Braille only: (i) placed in the space.	B1 for + 8 or × 3
Q8	(a)(i)	Candidates asked to write the word instead of circling. Diagrams enlarged.	B1 cao

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PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
Q10	(a)	13 pounds changed to 35 pounds. Diagram enlarged. Label for horizontal axis left aligned. Label for vertical axis placed above the axis. Right axis is labelled.	B1 for an answer of 16
Q10	*(b)	Diagram enlarged. Label for horizontal axis left aligned. Label for vertical axis placed above the axis. Right axis is labelled.	M1 for a correct conversion of any amount (lb to kg or kg to lb) excepting that in (a) M1 (dep M1) for a complete method to convert 100 kg (from 25×4) to lb (to compare with 200 lb) or to convert 50 lb (from 200÷4) to kg (to compare with 25 kg) C1 for "no" and a comparison with a converted weight of 212 - 228 pounds or 88 - 94 kg
Q11	(a)	Grid enlarged. Crosses changed to filled in circles.	B1 cao
Q11	(b)	Grid enlarged. Crosses changed to filled in circles.	B1 cao
Q11	(d)	Grid enlarged. Crosses changed to filled in circles.	B1 for line $x = 3$ drawn
Q11	(c)	Grid enlarged. Crosses changed to filled in circles. 'with a cross (x)' removed.	B1 for point marked at (–3, –1)

PMT

PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
Q12		Wording added: 'There are four spaces to fill.'	B1 cao B1 cao B1 cao B1 cao SC: If B0 scored award M1 for appropriate working shown
Q13	(a)	MLP only: x changed to y.	B1 cao
Q14		2 models provided for all candidates. MLP also have diagrams for Diagrams A and B. For third diagram, all have a diagram showing the side view and the end view . Wording is adjusted.	M1 for using 1 kg = 1000 g eg sight of 2000 or 0.6 M1 for using 1 cm = 10 mm eg sight of 400, 210, 25, 45, 35 or 8 M1 for evidence of considering three boxes eg 2.5×3 (=7.5) or reducing the 2kg parcel to compare with one box C1 for "yes" with correct conversions of dimensions and weight NB: Candidates can work in cm or in mm and in kg or g
Q15	(a)	MLP only: Frequency column is widened to allow for working.	B1 cao
Q15	(b)	MLP only: Frequency column is widened to allow for working.	M1 *fx* (at least 3 seen from 0×2, 1×12, 2×8, 3×6, 4×2) or for an answer of 56 A1 cao

PMT

PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
Q16	(a)	Diagram is enlarged.	M1 for any 1 correct line of symmetry, allow extras A1 for all 3 lines and no extras
Q16	(b)	Diagram is enlarged. 6 cm changed to 8 cm. Base line given on the diagram.	M1 for intersecting arcs of radii 8cm or an accurate triangle with no arcs A1 for a fully correct triangle with arcs
Q16	(c)	Diagram is enlarged. Diagrams enlarged.	M1 for 24 ÷ 3 (=8) A1 cao
Q16	(d)	Diagram is enlarged. Grid enlarged. Dots are 3 cm apart. Cut out shape provided for all. Braille candidates have extra shapes.	B2 for correct tessellation (at least 5 more shapes) (B1 for at least 4 shapes, including initial shape, correctly tessellating)
Q17	(a)	MLP only: a changed to e, b changed to f.	M1 for $2 \times 4 + 3 \times -5$ or $8 - 15$ oe A1 cao
Q18		Diagram enlarged. Angle arc put inside the angle size. Wording added: 'Angle DEB is marked x.'	M1 for angle *CEB* = 180 – 25 – 90 (= 65) or angle *ABE* = 90 – 25 (= 65) or for $x = 25 + 90$ A1 for 115 C1 (dep on M1) for full reasons, appropriate to their given method e.g. angles in a triangle add up to 180° **and** angles on a straight line add up to 180° e.g. the exterior angle of a triangle is equal to the sum of the interior opposite angles e.g. angles in a quadrilateral add up to 360° e.g. alternate angles are equal

PMT

PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
Q19	(a)	Diagrams enlarged.	M1 for 360 ÷ 45 oe or 2 × 8 or Roach identified as 6 or Bream identified as 8 A1 cao
Q19	(b)	Diagrams enlarged.	B1 for 'No' and correct explanation, e.g. the pie charts only show that the proportions OR explains that she could be correct if the total number of fish is the same in each chart OR explains that we don't know if she is correct because the total number of fish is not known.
Q21		2 models provided for all candidates. MLP also have diagrams. In text, wording is added to give the dimensions of the first cheese.	M1 for a method to find volume of a cuboid, eg. 2 × 10 × 15 (= 300) or 5 × 5 × x (= 25x) M1 (dep) for "300" ÷ "25" oe A1 cao OR M1 for 10 ÷5 (= 2) and 15 ÷ 5 (= 3) or 10 ÷5 (= 2) and 2 ÷ 5 (= 0.4) M1 (dep) for 2 × "2" × "3" or 15 × "2" × "0.4" A1 cao
Q23	(a)	MLP only: x changed to y.	B1 cao

PMT

PAPER: 1MA0_1F			
Question		**Modification**	**Notes**
Q25	(a)	Diagram enlarged. Crosses changed to filled in circles. Label for horizontal axis left aligned. Label for vertical axis placed above the axis. Right axis is labelled.	B1 for a description of a dynamic relationship eg "The older the car the lower the price" or "The newer the car the greater the price" oe (accept negative correlation)
Q25	(b)	Diagram enlarged. Crosses changed to filled in circles. Label for horizontal axis left aligned. Label for vertical axis placed above the axis. Right axis is labelled.	B2 for an answer in the range 6400 to 7000 OR M1 for a single straight line segment with negative gradient that could be used as a line of best fit or vert. line from 3.5 or a point plotted at (3.5, *y*), *y* in the range 6400 to 7000 A1 for 6400 to 7000
Q27		Diagram enlarged. Measurement lines for 1 metre and 2.2 metres are removed. Dashed measurement line for 3.4 metres.	M1 for splitting the shape (or showing recognition of the "absent" triangles) and using a method to find the area of one shape M1 for a complete method to find the total area, (= 9 m^2) M1 (dep M1) for a method to find the number of packs required from their total area, eg. "9" ÷ 2 = 4.5 rounded up to 5 M1 for a method to find 75% of 24.80 or 75% of the cost of their total number of packs, eg. $24.80 \times 5 \times \frac{75}{100}$ (= 93) or $24.80 \times \frac{75}{100}$ (= 18.6) C1 for a conclusion supported by fully correct answers, eg. showing 9 (m^2), 5 (packs) and 93 or 7 (from 100 – 93) **OR** M1 for method to find 75% of £24.80, eg. $24.80 \times \frac{75}{100}$ (= 18.6) M1 for method to find total number of packs Mary can buy, eg. 100 ÷ "18.60" = 5.3.... truncated to 5 or 10 (m^2) M1 for finding area of one relevant shape or showing how one pack (2 m^2) can fit in the diagram M1 (dep on previous M1) for complete method to show that 5 packs can cover the floor C1 for a conclusion supported by fully correct answers, showing the capacity (10) greater than total area (9)

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Mark Scheme (Results)

November 2015

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

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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.

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.

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.
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.
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 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.

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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 (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

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

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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)		4*x* + 20*y*	2	B2 for 4*x* + 20*y* (B1 for 4*x* or 20*y*)

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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	

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Question 24

Another familiar style of question and again answered well. Most students gained two marks for a correct answer in range. Of those who didn't it was surprising to see many failing to draw in a line of best fit, which students should be encouraged to do. Some students were able to gain a mark for taking a reading from $x = 34$

Question 21

In part (a) most students identified (100,18) as the outlier. A significant minority incorrectly gave (18,100) as the point.

Part (b) was less well answered than in previous years. Those who drew a line of best fit usually gained both marks as they went on to give an answer in the required range. But more often students relied on a guess, placing points near to the given points, or made some attempt to read off from 370. These approaches were far less successful and usually resulted in an answer outside the required range, such as 12 or 15.

Part (c) was answered well for a response type question, but students need to be reminded to state "yes" or "no". Many students gave a reason which recognised the outlier could be ignored when commenting on correlation.

Question 18

Part (a) was answered well, with the majority correctly identifying the coordinates of the outlier.

When the mark was not awarded, it was often due to either selecting (6, 1) as the outlier or for writing the coordinates incorrectly as (1, 2) but this was seen rarely.

Part (b) required learners to describe the relationship shown by the scatter graph and many students were able to correctly describe that as one variable increased, the other variable decreased. Stating negative correlation was also sufficient to gain the mark but of the students who did not describe the relationship in words, some just stated negative or negative gradient and did not use the word correlation. The other popular incorrect answer was to say there was a positive correlation.

In part (c) whilst some fully correct answers within the given range were seen, a large number of students were not able to use the graph correctly. It was common to see an incorrect line of fit being used and a few instances of a line of best fit being drawn from the origin and showing a positive gradient were also seen. Some lines were drawn across from 7 but students did not seem to know how to use this to read off an accurate figure.
Centres should ensure students have access to questions involving negative correlation.

Question 25

Descriptions of the relationship between age and weight were usually acceptable in part (a) where an increase in age related to an increase in weight. Some answers were vague quoting babies being "bigger" or "as babies grow". Some students were drawn into talking about the development of babies in the first 12 months without actually answering the question.
Positive correlation was accepted as a description of the relationship but "positive" alone was not. Direct proportion was another common answer that gained no marks.
In part (b), a correct answer in the given range was often seen (gaining full marks) although often the evidence shown on the graph was less convincing. Some read from the graph from 5.8kg but then approximated their readings to 2 months (outside of the range). Finding 5.8 on the axis was poorly executed. Very few candidates drew a line of best fit and if they did, it was often not in the correct place.

Question 21

This three part question centred around interpreting a given scatter diagram. Most learners were able to identify that the type of correlation was positive in (a). Common incorrect answers included ‘negative’, ‘increasing’, attempts at a description and a range of other wrong guesses but blank responses were seen less frequently.

In part (b), many learners were able to draw an acceptable line of best fit and gained the mark. When the mark was not awarded, it was often due to drawing a line from the origin to the corner of the grid which was outside the range of tolerance or simply joining the points in a dot to dot fashion. Learners should be reminded regularly that a line of best fit does not need to start at the origin and that the line must be straight and not curved.

Many learners reached an answer within the acceptable range in part (c), with some doing so even if their line of best fit was omitted or not fully within tolerance. For learners who drew a

line of best with fit with positive gradient such as from the origin, their reading was followed through and credit given if correct for their line, even if the previous mark had not been gained. Of the learners who had gained the mark in part (b) for a suitable line, some were unable to interpret the scale correctly and didn't recognise that each small square on the vertical axis represented a width of 0.5 m and interpreted each small square as representing either 1 m or 0.1 m leading to a frequently seen incorrect answer of 25.6.