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GCSE MATHS

Geometry and measures

Edexcel 1MA1 | Subtopic collection Topic 39

Right-angled trigonometry

Foundation tier

Answers and examiner comments

12	2013-2024	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.

Original question 18

The full source mark scheme begins on page 26. Use the original paper code, tier and question number shown above.

17			37.5	3	M1 for $90 + 5x + 7x = 180$ oe or uses the ratio of 5:7 eg 5+7 (=12) M1 for (x=) 90÷12 (=7.5) A1 cao

15		21	2	M1 for $ACD = 180 - 90 - 58$ oe (= 32) or for $CDB = 180 - 58$ (= 122) or for $x = 58 - 37$ A1 cao

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
*16		Bag A (supported)	3	M1 for $\frac{3}{7}$ or $\frac{5}{12}$ M1 (dep) for method to compare the two probabilities, e.g using a common denominator, eg $\frac{3}{7}=\frac{36}{84}$; $\frac{5}{12}=\frac{35}{84}$ or writing as decimals eg $\frac{3}{7}=0.428571...$ and $\frac{5}{12}=0.416666...$ C1 (dep on M2) for Bag A and correct method of comparison with correct figures using $\frac{3}{7}$ and $\frac{5}{12}$

23 (a)		2.7560…	M1	for 1.0654(059…), 0.1402(633…), 7.5957(541…), 2.756 truncated or rounded to no less than 2dp
			A1	for 2.7560(….)
(b)		2.76	B1	for 2.76 ft from (a)

Paper: 1MA1/2F

23	(a)	50.5	M1	for cos $ABC = \frac{7}{11}$ (0.63…) oe	Must be a complete statement for cos, sin or tan with all three elements present.
			A1	for answer in the range 50.4 to 50.51	If an answer is in the range 50.4 to 50.51 is given in the working space then incorrectly rounded, award full marks.
	(b)	Increase (supported)	C1	States increase with supporting reason eg " $\frac{7}{10}$ is greater than $\frac{7}{11}$ " " 0.636 is less than 0.7" …."cos increases as angle decreases" "decreasing the denominator increases the value of the fraction" "angle is now 45.6" (accept 45.5 – 45.6)	If figures are given they must be correct (truncated or rounded).

Paper: 1MA1/3F

Question	Answer	Mark	Mark scheme	Additional guidance
25	17.3	P1	for full process to find either angle eg (180 − 90) ÷ (2+3) ×2 **or** for 36 or 54 seen as an angle	May be seen on diagram Condone correct values if incorrectly placed.
		P1	for a correct equation using trigonometry eg cos [*A*] = 14÷ *AB*	This must be shown as an equation with all four elements (eg cos, [*A*], 14, *AB*) present. [*A*] could be 36 or any angle clearly and unambiguously identified as *A*. This also applies to [*B*] with Sine.
		P1	(dep previous P mark) for rearranging their trigonometry equation to make *AB* the subject eg (*AB* =) "14 ÷ cos 36"	
		A1	for an answer in the range 17.3 to 17.4	If an answer is shown in the range in working and then incorrectly rounded award full marks.

Paper: 1MA1/2F

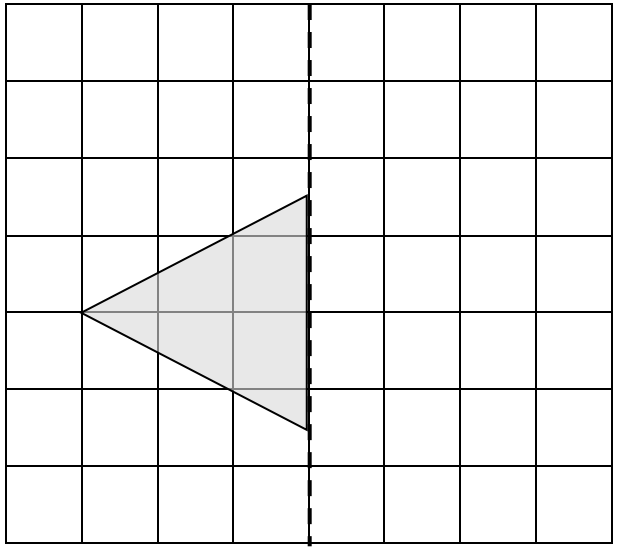
Question	Answer	Mark	Mark scheme	Additional guidance
24	9.85	M1	for $\sin(38) = \frac{AB}{16}$ oe **or** alternative method to find *AB*	
		A1	for an answer in the range 9.76 to 9.92	

26 (a)	17.8	M1	for $\tan 56 = \frac{x}{12}$ or $(BC) = 12 \times \tan 56$ oe **or** alternative method to find *BC*	For any alternative method candidates must arrive at an equation with BC as the only unknown
		A1	for an answer in the range 17.7 to 17.8	If an answer in the range 17.7 to 17.8 is given in the working space then incorrectly rounded, award full marks.
(b)	33.6	M1	for $\cos x = \frac{15}{18}$ **or** $\cos x = 0.83..$ **or** $x = \cos^{-1}\frac{15}{18}$ **or** alternative method to find *x*	For any alternative method candidates must arrive at an equation with *x* as the only unknown
		A1	for an answer in the range 33.5 to 33.91	If an answer in the range 33.5 to 33.91 is given in the working space then incorrectly rounded, award full marks.

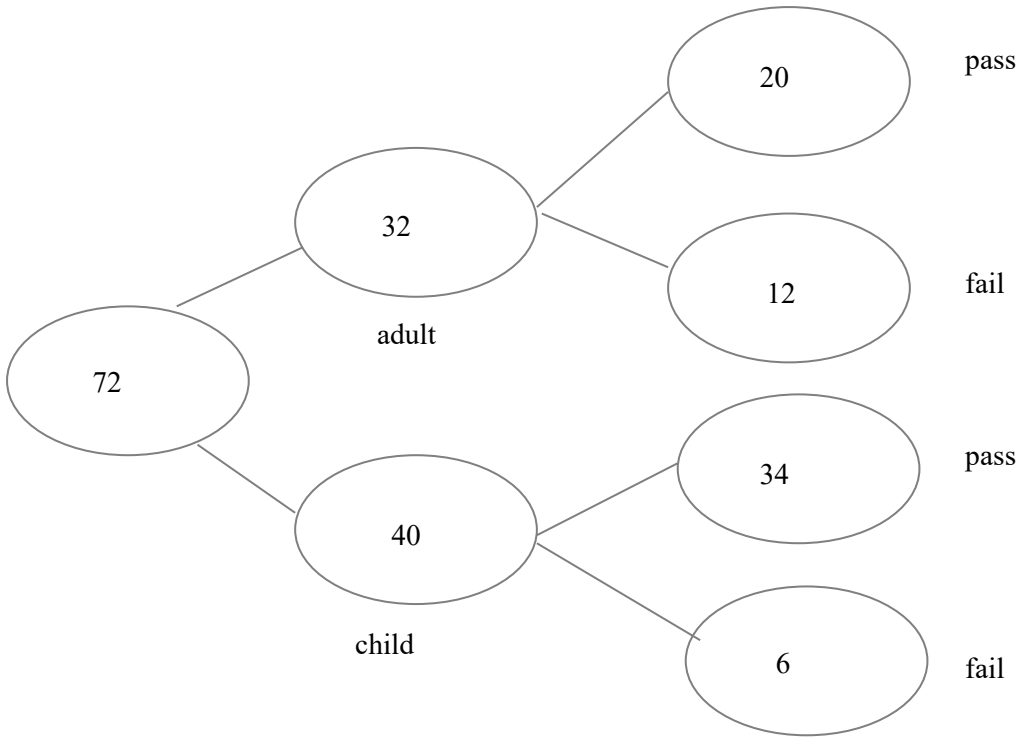
Paper: 1MA1/2F

30	0.5	B1	for 0.5 or $\frac{1}{2}$ oe	

Qu 3



Qu 17



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. Notes apply to both MLP papers and Braille papers unless otherwise stated.

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**
2		*e* changed to *p*.	Standard mark scheme but note change of letters
3		Wording added 'Look at the diagram for Question 3 in the Diagram Booklet. It shows a shaded triangle.'; 'You do not need to shade your shape. A cut out shape may be available if you wish to use it.' Cut out shape provided. Diagram enlarged. Shading changed. The dashed lines made longer and thicker. The mirror line labelled at the bottom of the line as well as the top.	Standard mark scheme
5		Wording added 'Write the three numbers below in order of size.'	Standard mark scheme
6		Wording added 'Look at the diagram for Question 6 in the Diagram Booklet. It shows a pictogram which…'. Diagram enlarged. The sun symbols changed to a hollow circle. The key moved above the diagram. The frame removed from the key.	Standard mark scheme
8		Wording added 'Look at the diagram for Question 8 in the Diagram Booklet. It is a bar chart which…'. Diagram enlarged. Shading changed. The right axis labelled. The axes labels moved to the top of the vertical axis and to the left of the horizontal axis. Part (a) wording added 'in the Diagram Booklet.'	Standard mark scheme

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
9		Wording added 'Look at the diagram for Question 9 in the Diagram Booklet. It shows a sequence of patterns made from shaded square tiles.'	
9	(a)	Wording added 'In the space below Pattern number 4, complete Pattern number 5.' The patterns stacked vertically. The labels moved to the left of the patterns. Diagram enlarged. Dotty shading. Pattern 4 repeated and labelled 'Pattern 5 (not completed)'. The candidate then needs to complete this pattern.	Standard mark scheme
9	(b)	Wording added 'Complete the table below.'; 'There are two spaces to fill.' Table turned vertical. For Braille: add (i) and (ii) in the blank spaces and add "Ans: (i) __ (ii) __"	Standard mark scheme
17		Wording added 'Look at the diagram for Question 17 in the Diagram Booklet. It shows an incomplete frequency tree.' In part (a) wording added 'in the Diagram Booklet.'; wording added 'There are seven spaces to fill.' Diagram enlarged. The labels moved above or below the circles. For Braille add (i), (ii), (iii), (iv), (v), (vi) & (vii) in the blank spaces, then add "Ans: (i) __ (ii) __ (iii) __ (iv) __ (v) __ (vi) __ (vii) __"	Standard mark scheme
18		Wording added 'Look at the information for Question 18 in the Diagram Booklet. It shows a…'. Frame removed. Racking lines have been added.	Standard mark scheme
20		Wording added 'Look at the diagram for Question 20 in the Diagram Booklet. It shows…'. Diagram enlarged. The labels moved above the diagrams. The dashed lines made longer and thicker. Shading changed.	Standard mark scheme

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
21		Wording added 'Look at the diagram for Question 21 in the Diagram Booklet. It shows an incomplete stem and leaf diagram.' Wording added 'Below are the ages…'. Wording added 'Show this information in the stem and leaf diagram in the Diagram Booklet.' Diagram enlarged. The key moved above the diagram. A horizontal line added to the bottom of the stem and leaf diagram to help them track along. For Braille: Sentence changed to "The list below shows the ages, in years, of 15 people." No diagram for Braille. Instead, add the sentence "You must include a key."	Standard mark scheme
22		A model may be provided. Wording added 'Look at the diagram for Question 22 in the Diagram Booklet. You may be provided with a model. The model is a cylinder. The diagram shows the plan and the side elevation of a cylinder on a grid.'; '1 square length on the grid represents 1 cm.' added to the Question Paper and the Diagram Booklet. Diagram enlarged. The labels moved above the diagram. 'height' labelled beside the side elevation. Braile wording as follows: "Ask for the model for Question 22. The model is NOT accurate. The model is a cylinder. Look at the diagram for Question 22 in the separate Diagram Booklet. The diagram is a grid of squares showing the plan and side elevation of a cylinder that has been placed on one of its flat faces. Each square on the grid represents a one centimetre square. Work out the …"	Standard mark scheme
27		Wording added 'Look at the diagram for Question 27 in the Diagram Booklet. It shows a regular hexagon and a regular pentagon which share a common side.'. Diagram enlarged. The angle moved outside of the angle arc and the angle arc made smaller. For Braille the diagram has hexagon ABCDEF and pentagon GHICB with x outside the angle arc. Wording now "The diagram is a regular hexagon, ABCDEF, and a regular pentagon, GHICB, joined at the common side, BC." "In the diagram, angle DCI is marked x."	Standard mark scheme

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
28	(a)	Wording added 'Complete the table below…'. The table turned vertical. Wording added 'There are four spaces to fill.' For Braille Add (i), (ii), (iii) & (iv) in the blank spaces and "Ans: (i) __ (ii) __ (iii) __ (iv) __"	Standard mark scheme
28	(b)	Wording added 'Look at the diagram for Question 28(b) in the Diagram Booklet. It shows a grid.' Diagram enlarged. Open headed arrows. Small squares removed. The axes labels moved to the top of the vertical axis and to the right of the horizontal axis.	Standard mark scheme
29		Wording added 'Look at the diagram for Question 29 in the Diagram Booklet. It shows cube A and cube B.' Wording added 'Cube A has sides of length 3 cm'; 'Cube B has sides of length 4 cm.' Diagram enlarged. The diagrams relabelled as 'cube A' and 'cube B'. Braille: have a model with the words "The models represent two cubes, A and B."	Standard mark scheme

30	$\frac{1}{2}$	B1	for $\frac{1}{2}$ oe	

Question	Answer	Mark	Mark scheme	Additional guidance
29	32.2	M1	for a correct trig statement, eg 28 × tan 49 or tan 49 = *AB* ÷ 28	Can use a combination of skills but must have only one unknown in *x* to score this mark
		A1	Answer in the range 32.2 to 32.22	If an answer is given in the range in working and then rounded incorrectly award full marks.

24	14.3	M1	for a correct statement for AB using trigonometry, eg $\tan 62 = \frac{AB}{7.6}$ **or** (AB =) $7.6 \times \tan 62$	
		A1	answer in the range 14.28 to 14.3	If an answer is given in the range in working and then rounded incorrectly award full marks

Paper: 1MA1/3F

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Mark Scheme (Results)

March 2013

GCSE Mathematics (Linear) 1MA0
Foundation (Non-Calculator) Paper 1F

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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 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.
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 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.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

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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.

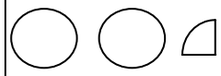
12 Parts of questions

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

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		8	1	B1 cao
	(b)		11	1	B1 cao
	(c)		$2\frac{1}{4}$ circles	1	B1 for $2\frac{1}{4}$ circles oe
2	(a)		Arrows on correct lines	1	B1 Arrows on correct lines with no extras marked
	(b)		8	1	B1 for 8 ± 0.2
	(c)		acute	1	B1 cao
	(d)		124	1	B1 for 124 ± 2
3	(a)		98 145 358 709 835	1	B1 cao
	(b)		–8 –5 –1 4 7	1	B1 cao
	(c)	(0.2, 0.25, 0.4, 0.5, 0.75) $(\frac{4}{20}, \frac{5}{20}, \frac{8}{20}, \frac{10}{20}, \frac{15}{20})$ (20%, 25%, 40%, 50%, 75%)	0.2 $\frac{1}{4}$ 40% 0.5 $\frac{3}{4}$	2	M1 for two correct conversions into the same form A1 cao If no method seen SCB1 for correct numbers in the reverse order

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1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)		Cross at $\frac{1}{2}$	1	B1 for cross (×) within overlay
	(b)		Cross at 0	1	B1 for cross (×)within overlay
	(c)(i)		H1 H2 H3 H4 H5 H6 T1 T2 T3 T4 T5 T6		M1 for evidence of attempting combinations eg at least 5 correct A1 for all 12, no extras or repeats (Can repeat H1)
	(ii)		$\frac{3}{12}$	4	M1 ft for evidence of correct numerator or denominator In a fraction less than 1 A1 ft from (i) Note probability must written as a percentage, decimal or fraction

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*5			20p	5	M1 for a method to find the price of the apples M1 for a method to find or use the price of 3 oranges ie 3×30 OR -30-30-30 M1 for a method to combine the costs of 'their fruit' **or** for a method to total the coins M1 (dep on at least M1 from the first M2 scored) for a method to find the difference between 'their total of the coins' and the price of both 'their fruits'. Could be 'total'-'total' or coins –'total' or coins – individual prices. It must be physically possible. C1 (dep on M1) for £0.20 or 20p and valid working OR M1 for a method to find the price of the apples M1 for a method to find or use the price of 3 oranges ie 3×30 OR -30-30-30 M1 for a method to select coins that equate to 'their total' for one fruit M1 (dep on at least M1 from the first M2 scored) for a method to select coins that equate to 'their total' for both fruits C1 (dep on M1) for £0.20 or 20p and valid working SC B1 £0.20 or 20p as the answer , no working shown

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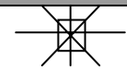
1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)			2	M1 for any 1 correct line of symmetry allow extras A1 for all 4 lines and no extras
	(b)		2	1	B1 cao
	(c)		70	2	M1 for 7×10 A1 for 70
7	(a)		4	1	B1 cao
	(b)		13	1	B1 cao
	(c)		11 and 14	1	B1 cao
	(d)		4	2	M1 for $14-10$ or $10-14$ or -4 or 10 to 14 or 14 to 10 A1 cao
	(e)	4 + 3 + 2 + 5 + 3	17	2	M1 for adding at least 4 correct heights out of 4 or 5 heights A1 cao

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1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*8	(a)		20 45	1	B1
	(b)	Example of figures for comparison 7min 30 sec with 7 min 28 secs 3 mins 43 secs with 3mins 45 secs 224 secs with 225 secs 3mins 44 secs with 3 mins 45 secs	No	3	M1 for doubling Seeta's time or halving Ninal's time or finding the difference between the two times Eg 3 min 45 sec × 2 or (7m 28s) ÷ 2 or 7m 28s-3min 45 secs M1 for a complete method to convert their time(s) to common units with the units stated C1 for No and **correct** figures compared (could be in secs or mins and secs)
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**
10	(a)		parallelogram	1	B1 Allow trapezium
	(b)		isosceles	1	B1
	(c)		6	2	M1 for a complete method to find the area A1 cao Note: For dots to be a valid method candidates must give an answer in the range 5 to 7
11	(a)(i)		(4, 3)	2	B1 cao
	(ii)		(–4, –1)		B1 cao
	(b)		(0, 1)	2	M1 for (0, 1) marked on the graph or (0, y) or (x, 1) A1 cao
12	(a)		reflection	2	B2 for correct reflection in correct position (B1 for at least 2 vertices in the correct position)
	(b)		enlargement	2	B2 for correct enlargement scale factor 3 (B1 for at least 2 lines correctly enlarged or any enlargement using an incorrect scale factor, sf $\neq 1$)
	(c)		105	2	M1 for 360 – (90 + 128 + 37) oe or x + 90 + 128 + 37 = 360 A1 cao

PMT

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
13	(a)		32	2	M1 for 4 × 5 + 12 oe A1 cao
	(b)		7	3	M1 for 40 – 12 or 28 seen M1 (dep) for '28' ÷ 4 A1 cao OR M1 for 12 + 4 + 4 + ... M1 for 12 + 7 × 4 oe A1 cao OR M1 for 12 + 4x = 40 oe M1 for 4x = 40 – 12 oe A1 cao NOTE: A correct embedded answer scores M2 A0 OR M1 ft for '32' + 4... or 40–'32' M1 ft for 5 + 1 ... oe A1 ft Note: Do not follow through from part a an answer of 40

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
14	(a)		8	1	B1 for 8 (.00)
	(b)		550	4	M1 for 600 – 200 (= 400) M1 for correct method to convert '$400' to £ M1 (dep on the previous M1) for 800 – '$400' in £s A1 for value in the range 540 –560 OR M1 for correct method to convert $600 **and** $200 to pounds M1 for '375'–'125' M1 (dep on the previous M1) 800 –'250' A1 for a value in the range 540-560 OR M1 for correct method to convert £800 to dollars M1 for '1280' + 200 – 600 M1 (dep on the previous M1) for attempt to convert '$880' back to £ A1 for value in the range 540 – 560
15			3 primes that total 20	3	M1 for identifying at least 2 different prime numbers from the list, could indicate on the list (not more than one incorrect) M1 for any 3 numbers from the list that total 20 A1 for 2, 7, 11 or 2, 5, 13 or both (in any order)

<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>16</td><td></td><td></td><td>09 36</td><td>3</td><td>M1 for listing 9, 18, 27, 36, 45, ... (at least 3 correct multiples with at most one incorrect)
M1 for listing 12, 24, 36, 48, ... (at least 3 correct multiples with at most one incorrect)
A1 for 09 36 or 9 36(am)

OR
M1 for listing 9.09 9.18 9.27 9.36 ... (at least 3 correct times with at most one incorrect)
M1 for listing 9.12 9.24 9.36 ... (at least 3 correct times with at most one incorrect)
A1 for 09 36 or 9 36(am)

OR
M1 for 9 = 3 × 3 or 12 = 2 × 2 × 3 (could be in a factor tree)
M1 for 9 = 3 × 3 and 12 = 2 × 2 × 3 (could be in a factor tree)
A1 for 09 36 or 9 36(am)

SC B2 9 36pm or (after) 36 (minutes) on the answer line</td></tr>
<tr><td>17</td><td></td><td><table><tr><th>Colour</th><th>Tally</th><th>Frequency</th></tr><tr><td>Red</td><td></td><td></td></tr><tr><td>Blue</td><td></td><td></td></tr><tr><td>Green</td><td></td><td></td></tr><tr><td>Silver</td><td></td><td></td></tr></table></td><td>Data collection table</td><td>3</td><td>B3 for correct table with all three aspects without repeats

Aspect 1: colour (of car) or for at least 3 of red, blue, green, other etc.
Aspect 2: ‘tally’ or tally marks or ‘frequency’ or ‘number of cars’
Aspect 3: ‘frequency’ or ‘total(s)’ or ‘number of cars’

(B2 for two aspects)
(B1 for one aspect)</td></tr>
</table>

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
*18			35° with reasons	4	M1 for correct method to find one angle eg 70 or 110 (angles could be on the diagram) M1 for a complete correct method to work out x A1 (dep on M1) for 35° C1 for complete geometric reasons for their chosen method without extras eg exterior angle = sum of interior opposite angles **and** base angles of an isosceles triangle are equal OR angles in a triangle add up to 180 **and** angles on a straight line add up to 180 **and** base angles of an isosceles triangle are equal OR M1 $x + x + 20 + 90 = 180$ M1 for a complete correct method to work out x A1 (dep on M1) for 35° C1 for complete geometric reasons for their chosen method without extras eg angles in a triangle add up to 180 **and** base angles of an isosceles triangle are equal

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19		183 × 47 1281 7320 8601 1 8 3 × 4 (3 2) (1 2) 4 8 7 (5 6) (2 1) 7 6 0 1 100 80 3 4000 3200 120 40 700 560 21 7 4000 + 3200 +120 + 700 + 560 + 21 = 8601	86.01	3	M1 for a complete method to multiply 183 by 47 (condone one multiplication error) A1 for digits 8601 given as the answer B1 (dep on M1) for correctly writing their answer to 2 decimal places

PMT

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
20	(a)		2 reasons	2	B2 for 2 different reasons from given examples (B1 for 1 reason from given examples) eg No time frame eg No box for less than £10 accept no box for zero or none or £0 eg Overlapping intervals or boxes or £30 and/ or £50 in two boxes
	(b)		1 reason	1	C1 for reason why the sample is biased eg • they are **only** in the CD store • the people in the store are more likely to buy CDs • she needs to ask people outside the CD store oe
21			required region	4	M1 arc radius 5 cm centre *C* M1 bisector of angle *BAD* M1 line 3 cm from *DC* A1 for correct region identified (see overlay)

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
22			730	5	M1 for $\frac{5}{100}\times 200$ (= 10) oe M1 for $\frac{10}{100}\times 350$ (= 35) oe M1 for 6 × '10' **or** 4 × '35' M1 (dep on M1 earned for a correct method for a percentage calculation) for '60' + '140'+ 530 A1 cao **Or** M1 for 6 × 200(= 1200) **or** 4 × 350(= 1400) M1 for $\frac{5}{100}\times "1200"(=60)$ oe M1 for $\frac{10}{100}\times "1400"(=140)$ oe M1(dep on M1 earned for a correct method for a percentage calculation) for '60' + '140'+ 530 A1 cao

PMT

1MA0_1F					
Question		**Working**	**Answer**	**Mark**	**Notes**
23			240	4	M1 for 16 × 2 (= 32 girls) M1 for 16 + '16 × 2' (= 48) M1 (dep on the previous M1) for (16 + '32') × 5 **or** (16 + '32') × (4 + 1) A1 cao OR M1 for 1 : 2 = 3 parts M1 for 5 schools × 3 parts (= 15 parts) M1 (dep on the previous M1) for '15' parts × 16 A1 cao **SC B2** for 176 given on the answer line

PMT

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Question 24

This question was very poorly answered suggested that many students had not covered trigonometry as part of their course, or were insufficiently confident in the application of trigonometry. Many tried simply using the numbers in the question in a variety of incorrect calculations. Students with some knowledge of trigonometry usually selected sine as the function to use, although cosine and to a lesser extent tangent were sometimes their choice. The correct quoting of sin 38° was usually followed by a fully correct solution. Some students however, having their calculators set on an incorrect mode, were unable to score full marks. Correct answers written in the body of a script, and then rounded or truncated incorrectly, gained full credit. Less able students often worked out the missing angle and gave that as their answer rather than finding the side as required.

Question 26

Neither part of this question was well answered ad there were a disappointing number of blank responses.

A few students indicated the recognition of the need to use trigonometric ratios. Of these, some wrote down SOHCAHTOA or drew "formula triangles" but were not able to select the most appropriate ratio to use.

Students who correctly identified they needed to use the tangent ratio in part (a) normally scored both marks. When only 1 mark was awarded, the final mark was often lost due to poor application of the calculator for example the calculator was not in degree mode.
The most common incorrect approach seen was to use the sum of the angles in a triangle by subtracting 90°and 34° from 180°, despite the question requiring a missing length to be calculated. Some attempted to use Pythagoras, squaring the 34 and the 12, mixing angles and side lengths was seen.

Part (b) was very similar to part (a) in the quality of response. For those who realised the need to use trigonometry many did not identify the correct ratio to use or know that the inverse function was needed in order to find an angle. Although $\frac{15}{18} = 0.83$ was sometimes calculated and formed part of the working, this was insufficient for credit to be given as a correct equation involving cos x was required.

Some students gave an answer of 34 which had evidently come from assuming the angles in the diagram from part (a) were the same as 90 - 56 was also seen as the working.

Less often seen was an answer of 33 from adding the side lengths. Another common incorrect answer of 45 came from assuming the triangle is isosceles. Some attempted to use Pythagoras's Theorem but were unable to complete the alternative approach far enough to be credit worthy.

Question 30

This final question was very poorly answered by students, many leaving the solution blank.

Summary:

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

- take more care when reading the questions. There were a considerable number of misreads which prevented complete solutions.
- write clearly so that correct values quoted are not altered in subsequent working.
- be more careful when performing simple arithmetic calculations, particularly in build-up methods.
- think about the reasonableness of their answers.
- set their working out clearly, crossing out working that is being replaced.
- avoid any temptation to merely offer an answer only without showing their working.
- be able to convert fractions of an hour into minutes.
- know the difference between an interior angle and an exterior angle of a regular polygon.

Question 30

Only the most able students were able to quote 0.5 oe as their answer. Some wrote $\frac{\sqrt{1}}{2}$ and we even saw $\frac{\sqrt{4}}{4}$ but these gained no credit unless simplified to give an 'exact value' as required.

Question 29

This standard question involving trigonometry was not answered well. Of the students able to link the question to trigonometry, many used the formula sheet to effectively rewrite SOHCAHTOA next to the question but many were unable to identify the correct trigonometric ratio to use. When tangent was used, the answer was often calculated correctly and given to the appropriate degree of accuracy but some often incorrectly substituted the angle in place of a side in the formula. Quite a few students tried using Pythagoras' Theorem to calculate the lengths or tried to use angle properties of a triangle to try to find the unknown angle.

Question 24

Some were able to work with trigonometry correctly, those that produced a correct trigonometric statement or equation generally went on to gain 2 marks; a small number had the correct method but prematurely rounded their answer to 14, without first seeing an answer in range this was awarded M1A0. Many attempts to use Pythagoras were seen.