AQA

GCSE
Mathematics

Paper 1 Foundation Tier

Mark scheme

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Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between a and b inclusive.
[a, b)	Accept values $a \leq$ value $< b$
3.14 …	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

Question	Answer	Mark	Comments
1	0.6	B1	
	Additional Guidance		
2	75	B1	
	Additional Guidance		
3	Rhombus	B1	
	Additional Guidance		
4	–19	B1	
	Additional Guidance		
5a	17	B1	
	Additional Guidance		
5b	9	B1	
	Additional Guidance		

Question	Answer	Mark	Comments
5c	–2	B1	
	Additional Guidance		

6a	Division set up, with 8 and a remainder 3 seen in correct position or 830 ≤ answer < 840 but not 834	M1	$\begin{array}{r} 8 \\ \overline{)91^{3}74} \end{array}$ or $\begin{array}{r} \quad 8 \\ \overline{)9\ 1\ 7\ 4} \\ \underline{8}\ \underline{8} \\ \quad 3 \end{array}$
	834	A1	
	Additional Guidance		
	Build up method or chunking method must lead to 830 ≤ answer < 840 to score M1 or better		

Question	Answer	Mark	Comments
6b	$\frac{35}{42}$ (+) $\frac{18}{42}$	M1	oe fractions with a correct common denominator and at least one correct numerator
	$\frac{53}{42}$	A1	oe improper fraction
	$1\frac{11}{42}$	B1ft	oe mixed number ft for correct conversion of an improper fraction to a mixed number
	Additional Guidance		
	For B1ft the mixed number must not be an integer		
	Beware 5 + 3 = 53		M0
	When attempts are made to cancel the fraction, full marks cannot be scored		
	$\frac{53}{42} = \frac{9}{4} = 2\frac{1}{4}$ (attempt to cancel occurs before conversion to mixed number)		M1A1B0
	$\frac{53}{42} = 1\frac{11}{42} = 1\frac{1}{3}$ (attempt to cancel occurs after completely correct answer seen)		M1A1B0

7a	4	B1	
	Additional Guidance		

Question	Answer	Mark	Comments
7b	3 + 6 + 6 + 9 + 4 or 28	M1	at least four correct and intention to add
	their 28 ÷ 4	M1dep	oe
	7	A1	
	Additional Guidance		
	Totals other than 28 must be evidenced for M1 or M2		
	3 + 6 + 6 + 9 + 4 = 29, 29 ÷ 4, answer = 7		M1M1A0
8	17 (days)	B1	may be implied
	their 17 × 8 or 136 or their 17 × 0.08	M1	oe eg build up – must be fully correct method repeated addition can imply their number of days
	1.36	A1ft	ft their 17 accept 136p if £ sign deleted
	Additional Guidance		
	16 (days) and £1.28 18 (days) and £1.44		B0M1A1ft B0M1A1ft
	Answer only £1.28 Answer only £1.44		B0M0A0 B0M0A0
	Beware digits arising from incorrect work eg 18 × 0.8 = 14.4(0)		B0M0A0
	Condone £1.36p		B1M1A1

Question	Answer	Mark	Comments
9a	$\frac{3}{25}$ or 0.12 or 12%	B1	oe fraction, decimal or percentage
	Additional Guidance		
	Do not accept ratios		
	Ignore use of words eg 3 out of 25 = $\frac{3}{25}$ eg 3 in 25 (only)		B1 B0
	12		B0
	Ignore attempts to simplify $\frac{3}{25}$ eg $\frac{3}{25} = \frac{1}{8}$ (attempt to simplify) $\frac{3}{25}$ = 0.03 (attempt to convert to a decimal) $\frac{3}{25}$ = 3 : 25 (choice)		B1 B1 B0

Question	Answer	Mark	Comments
9b	E1, E3 and E3, E4 and C2, D2	B2	B1 for 1 pair correct and 0 incorrect or 2 pairs correct and 0 incorrect or 2 pairs correct and 1 incorrect or 3 pairs correct and 1 incorrect or E1, E3, (E3), E4, C2 and D2 listed, but not clearly in pairs and with no additional squares other than E2 listed
	Additional Guidance		
	Accept 1E for E1 etc		
	Ignore listing of E2 if included		
	Ignore any annotations on diagram		
	If pairings seen in working, allow list without pairings on answer line		

Question	Answer	Mark	Com8ments

10

Fraction	Percentage
	30(%)
$\frac{43}{100}$	
	250(%)

B3

B1 for each correct answer

Additional Guidance

Do not accept fractions with non-integer numerator or denominator eg $\frac{4.3}{10}$ (unless it is an attempt to cancel after correct answer seen)	B0
Ignore attempts to cancel $\frac{43}{100}$ once correct fraction seen	

11a

$\frac{2}{5}$	B1	

Additional Guidance

11b

$\frac{5}{9}$ × 72 or 8 × 5 or 360 ÷ 9	M1	oe eg multiples of 8 listed and 5th one chosen with maximum one error
40	A1	SC1 32

Additional Guidance

$\frac{40}{72}$	M1A0
40 out of 72	M1A1

Question	Answer	Mark	Comments
12a	8	B1	
	Additional Guidance		

12b	2	B1	
	Additional Guidance		

13	1 – 0.1 – 0.6 or 1 – (0.1 + 0.6) or 1 – 0.7	M1	oe
	0.3	A1	oe eg 30% or $\frac{3}{10}$
	Additional Guidance		
	1 – 0.1 + 0.6 = 0.3 (recovered) 1 – 0.1 + 0.6 = 1.5 (not recovered) 0.6 ÷ 2 = 0.3 (incorrect method)		M1A1 M0A0 M0A0
	Embedded, correct answer, eg 0.3 + 0.1 + 0.6 = 1		M1A0
	$\frac{0.3}{1}$ unless 0.3 already seen		M1A0

<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="4">14</td><td>Identifies or plots any two correct points</td><td>M1</td><td>points with integer values are
<table><tr><td>x</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>-1</td></tr></table>may be in a list
ignore incorrect plots</td></tr>
<tr><td>Correct straight ruled line from (–3, 5) to (3, –1)</td><td>A1</td><td>ignore incorrect plots if correct line drawn</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Correct line, but not extending from (–3, 5) to (3, –1)</td><td>M1A0</td></tr>
<tr><td colspan="2">Two lines, one correct and one incorrect</td><td>M1A0</td></tr>
<tr><td rowspan="4">15</td><td colspan="3">Alternative method 1</td></tr>
<tr><td>Method for finding a percentage beyond 5% or 1%</td><td>M1</td><td>eg
6.2 ÷ 2 or 3.1 (0.5%)
31 + 6.2 or 37.2 (6%)
31 × 2 or 62 (10%)
6.2 + 6.2 or 12.4 (2%)
31 × 3 or 93 (15%)
6.2 × 3 or 18.6 (3%)</td></tr>
<tr><td>Fully correct method that would lead to the correct answer</td><td>M1dep</td><td>eg
their 93 – their 12.4
(their 3.1 + their 37.2) × 2
their 62 + their 18.6</td></tr>
<tr><td>80.6</td><td>A1</td><td></td></tr>
</table>

Alternative method 2 is on the next page

Question	Answer	Mark	Comments
15 cont	**Alternative method 2**		
	6.2 × 13 or 62 × 13	M1	may be implied
	10 × 6.2 + 3 × 6.2 or 62 + 18.6 or 6 × 13 + 0.2 × 13 or 78 + 2.6 or digits 806 other than 80.6	M1dep	<u>From traditional method</u> their 186 + their 620 or their 26 + their 780 at least one correct and placeholder of zero correct or implied <u>From grid method</u> their 600 + their 20 + their 180 + their 6 at least three correct <u>From Chinese / Napier's bones method</u> at least three values correct from (0)/6, (0)/2, (0)/6 and 1/8 and then appropriate diagonal adding
	80.6	A1	
	Additional Guidance		
	In all cases, accept repeated addition for multiplication eg accept 31 + 31 for 2 × 31		
	Ignore a % sign after 80.6		

<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="4">16</td><td>$\frac{1}{5}$ in top centre cell
1 in centre cell
$\frac{1}{10}$ in bottom right cell</td><td>B3</td><td>oe decimals
B2 any two correct
or
the product of the centre column and the diagonal from top left to bottom right are both 1
B1 any one correct
or
the product of the centre column or the diagonal from top left to bottom right is 1</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">A response can be awarded B2 if it meets both ways of scoring B1
Eg one correct value and the product of the centre column is 1 (see example below right)</td><td></td></tr>
<tr><td colspan="2">
<table>
<tr><td>10</td><td>$\frac{1}{15}$</td><td>$\frac{1}{2}$</td></tr>
<tr><td>$\frac{1}{20}$</td><td>3</td><td>20</td></tr>
<tr><td>2</td><td>5</td><td>$\frac{1}{30}$</td></tr>
</table>
Diagonal and centre column each have product 1
or
<table>
<tr><td>10</td><td>$\frac{1}{50}$</td><td>$\frac{1}{2}$</td></tr>
<tr><td>$\frac{1}{20}$</td><td>10</td><td>20</td></tr>
<tr><td>2</td><td>5</td><td>$\frac{1}{10}$</td></tr>
</table>
Bottom right cell correct and centre column = 1
</td><td>B2</td></tr>
<tr><td colspan="2">Centre column has product 1
<table>
<tr><td>10</td><td>$\frac{1}{50}$</td><td>$\frac{1}{2}$</td></tr>
<tr><td>$\frac{1}{20}$</td><td>10</td><td>20</td></tr>
<tr><td>2</td><td>5</td><td>$\frac{2}{10}$</td></tr>
</table>
or
Diagonal has product 1
<table>
<tr><td>10</td><td>$\frac{1}{20}$</td><td>$\frac{1}{2}$</td></tr>
<tr><td>$\frac{1}{20}$</td><td>8</td><td>20</td></tr>
<tr><td>2</td><td>5</td><td>$\frac{1}{80}$</td></tr>
</table>
</td><td>B1</td></tr>
</table>

Question	Answer	Mark	Comments
17a	3 or 35 or 291 seen or 8 × their 3 + 11	M1	
	35 chosen	A1	
	Additional Guidance		
17b	Subtract 11 and divide by 8	B1	accept – or ÷ for words subtract and divide but not / for divide
	Additional Guidance		
	Do not accept use of algebra eg $(x - 11)/8$		B0

Question	Answer	Mark	Comments
18	**Alternative method 1**		
	Angle *DAB* = 70	B1	may be on diagram
	Angle *ABC* = 360 – their 70 – 90 – 120 or Angle *ABC* = 80	M1	may be on diagram
	Valid reason	A1	eg 180 – 80 = 100 80 + 100 = 180 angles on a straight line add to 180 (360 – 80 – 80)/2 = 100
	Alternative method 2 working backwards from x = 100		
	Angle *ABC* = 180 – 100 or Angle *ABC* = 80	M1	may be on diagram
	Angle *DAB* = 360 – their 80 – 90 – 120 or Angle *DAB* = 70	M1dep	may be on diagram
	Valid reason	A1	eg opposite angles are equal vertically opposite angles (are equal) 180 – 70 = 110 and 180 – 110 = 70
	Additional Guidance		
	Incorrect angles seen anywhere around A or B cannot score the A1		

Question	Answer	Mark	Comments
19	Method for equating gallons to litres beyond 2 gallons = 9 litres	M1	eg 9 ÷ 2 or 4.5 17 × 9 or 153 9 × 2 or 18 9 × 8 or 72 17 ÷ 2 or 8.5
	Fully correct method that would lead to the correct answer	M1dep	eg 9 ÷ 2 × 17 their 4.5 × 17 their 153 ÷ 2 their 18 × 4 + their 4.5 their 72 + their 4.5 their 8.5 × 9
	76.5	A1	
	Additional Guidance		
	2 gallons = 9 litres 4 gallons = 18 litres 6 gallons = 36 litres (error with working not shown) 8 gallons = 45 litres 45 + 45 + 4.5 = 94.5		M1M0A0
	2 gallons = 9 litres 9 + 9 = 18 so 4 gallons = 18 litres 18 + 9 = 36 so 6 gallons = 36 litres (method correct) so 8 gallons = 45 litres 45 + 45 + 4.5 = 94.5		M1M1A0

Question	Answer	Mark	Comments

20a

n = an odd number and p = a prime number such that $n + p$ is a square number	B1	eg n = 1 and p = 3 n = 9 and p = 7

Additional Guidance

Some of the early correct pairs are :-

n	***p***
1	3
3	13
5	11
7	2 or 29
9	7
11	5
13	3 or 23
17	19
19	17
23	2
25	11
31	5

B1

20b

n = an odd number and p = a prime number such that np is a square number	B1	eg n = 3 and p = 3 n = 27 and p = 3

Additional Guidance

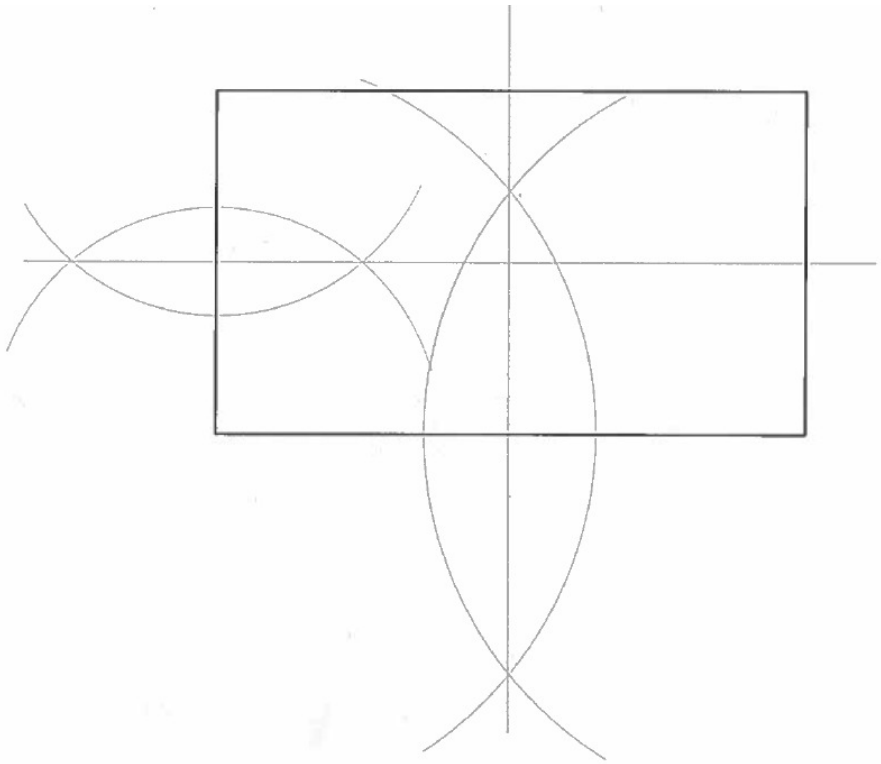
Some of the early correct pairs are :-

n	***p***
3	3
5	5
7	7
11	11
13	13
17	17
23	23
27	3

B1

Question	Answer	Mark	Comments
21a	The arcs should be drawn from *C* or from points the same distance from *C* or The lines are different lengths, so you can't go from the ends	B1	oe
	Additional Guidance		
	CB ≠ CD		B1
	Not drawn an arc from C		B1
	He put compass in wrong place. He should have started at C but he started at B and D		B1
	Should be an arc on each line CB and CD		B0
	Arcs in wrong place		B0
	Arcs aren't equal		B0
	His line isn't in the centre of B and D		B0
	D has a longer line than B		B0
	Arcs aren't the same radius		B0
	Should be an arc from B to D		B0
	Should be an arc from B to the line CD		B0
	Should be an intersection on CB and CD		B0

Question	Answer	Mark	Comments
21b	It should be a circle, (not a square) or The corners are too far away	B1	oe eg accept circle constructed inside square, touching at midpoints of square to within 2mm
	Additional Guidance		
	A correct diagram takes precedence over statements, otherwise ignore diagram		
	Any distances if quoted, eg to corners, should be accurate to within 2mm		
	Ignore any reference to the top point P		
	The corners are more than 3 (km or cm) away from the point	B1	
	Some points are more than 3 (km or cm) away	B1	
	It isn't 3 (km or cm) to the corners	B1	
	Each corner is [4.1, 4.5] (km or cm) from P (values represent tolerance)	B1	
	Each corner is more than 4 away	B1	
	It should be a circle	B1	
	Each point is 4.2 km from P (not true)	B0	
	The corners of the square are 4 km (out of tolerance)	B0	
	The corners of the square are 4 km while the rest are 3 km	B0	
	Each corner will be more than 1 km away	B0	
	She's measured 3 cm from P without checking the corners	B0	
	It is not supposed to be this shape (but what should it be?)	B0	
	She has measured 4.3 km not 3 (not stated corners)	B0	
	She hasn't shown all the points that represent 3 km	B0	
	She hasn't plotted where all the 3 km points are	B0	
	It shouldn't be a square	B0	

Question	Answer	Mark	Comments
21c	One pair of equal, intersecting arcs from the vertices of one side of the rectangle	M1	tolerance ± 1 mm
	Fully correct construction of line of symmetry with either two pairs of equal, intersecting arcs from the vertices of the same side of the rectangle or one pair of equal, intersecting arcs from the vertices of one side of the rectangle and the diagonals drawn	A1	tolerance ± 1 mm line of symmetry may be solid or dashed but must touch opposite sides of rectangle
	Additional Guidance		
	Correct line with no appropriately constructed arcs		M0A0
			

Question	Answer	Mark	Comments
22	**Alternative method 1**		
	88 ÷ (7 + 4) or 88 ÷ 11 or 8	M1	oe 11 × 8 = 88
	their 8 × 7 and their 8 × 4 or their 8 × 7 and 88 – their value or their 8 × 4 and 88 – their value or 56 and 32 or their 8 × (7 – 4) or their 8 × 3	M1dep	oe eg 8 × 7 = 63 and 88 – 63 eg 8 × 4 = 30 and 88 – 30
	24	A1	
	Alternative method 2		
	One correctly evaluated trial for two numbers, other than 7 and 4, in the ratio 7 : 4	M1	eg 70 + 40 = 110
	56 and 32	M1dep	eg 56 + 32 = 88
	24	A1	
	Alternative method 3 using x : y = 7 : 4 (correct)		
	$4x = 7y$ and $4x + 4y = 352$	$4x = 7y$ and $7x + 7y = 616$	M1	oe forming equation from ratio and equating coefficients
	$11y = 352$ or $y = 32$	$11x = 616$ or $x = 56$	M1dep	oe equation in one variable
	24		A1	

Alternative method 4 is on the next page

Question	Answer	Mark	Comments

22 cont	**Alternative method 4** using $x : y = 4 : 7$ (incorrect)			
	$7x = 4y$ and $4x + 4y = 352$	$7x = 4y$ and $7x + 7y = 616$	M1	oe forming equation from ratio and equating coefficients
	$11x = 352$ or $x = 32$	$11y = 616$ or $y = 56$	M1dep	oe equation in one variable
	their answer		A0	
	Alternative method 5 using $x : y = 7 : 4$ (correct)			
	$x = \frac{7}{4}y$ or $y = \frac{4}{7}x$ or $x = 88 - y$ or $y = 88 - x$		M1	oe making one variable the subject
	$\frac{7y}{4} + y = 88$ or $\frac{11}{4}y = 88$ or $x + \frac{4}{7}x = 88$ or $\frac{11}{7}x = 88$		M1dep	oe equation in one variable
	24		A1	
	Alternative method 6 using $x : y = 4 : 7$ (incorrect)			
	$y = \frac{7}{4}x$ or $x = \frac{4}{7}y$ or $x = 88 - y$ or $y = 88 - x$		M1	oe making one variable the subject
	$\frac{7}{4}x + x = 88$ or $\frac{11}{4}x = 88$ or $y + \frac{4}{7}y = 88$ or $\frac{11}{7}y = 88$		M1dep	oe equation in one variable
	their answer		A0	
	Additional Guidance			
	–24, with no incorrect working, implies 56 and 32			M1M1A0
	$x = 32$ and $y = 56$			M1M1A0

Question	Answer	Mark	Comments
23	Valid criticism referring to the line from (0, 0) to (10, 1)	B1	eg there shouldn't be a curve need to be specific about the line shape, it is not sufficient to simply say it is wrong
	Valid criticism referring to the line from (15, 1)	B1	oe eg he never goes 2 km from home
	Additional Guidance		
	Criticisms can be in either order		
	A correct diagram takes precedence over statements, otherwise ignore diagram		
	For first B1:		
	The first part is curved		B1
	The curve should be a straight line		B1
	He has drawn a curve for constant speed		B1
	The line is curved which shows his speed was not consistent/constant		B1
	He's not going at a constant speed to the shop (correct referral to graph)		B1
	All lines should be straight		B1
	Constant speed should be a diagonal/straight line		B1
	The line shouldn't curve		B1
	The constant speed should be		B1
	The curved line shows he decreased speed		B1
	It should be a straight line from 0 to 10		B1
	It should be a straight line at the start		B1
	A distance-time graph shouldn't have curves		B0

Continued on next page

23 cont	It should be a straight line ('It' seems to be referring to the whole graph)	B0
	The curved line shows he increased and decreased speed	B0
	He was walking at a range of speeds, so not consistent (referral to whole graph)	B0
	The constant speed is drawn incorrectly (how?)	B0
	The lines should be curved or straight, not both	B0
	The curve should be a line of best fit	B0
	It should be a straight line from 0 to 15 (it should be to 10)	B0
	The curve is wrong (how?)	B0
	For 2nd B1:	
	The line should go down at the end	B1
	He isn't walking home, he's walking further away	B1
	He has walked away from home when he hasn't	B1
	The line should go back to the bottom of the graph	B1
	The graph should return to zero	B1
	The last part should be decreasing (instead of increasing)	B1
	The line for him walking home should have negative gradient	B1
	The graph shows he didn't walk home	B1
	The line for him walking home should have negative correlation	B0
	The line for the journey home goes the wrong way	B0
	The graph does not show his journey home	B0
	His house is 2 km away from the shop	B0
	The line should be decreasing instead of increasing (which line?)	B0
	His home is 1 km from the shop not 2 km	B0

Question	Answer	Mark	Comments
24	**Alternative method 1**		
	Three whole numbers that each are less than 80 and have units digit 4 or States that each number must have units digit 4	M1	
	82	A1	
	Alternative method 2		
	Correctly evaluated trial for three whole numbers, none of which are a multiple of 10, and that, when rounded, total 70	M1	eg 33 + 33 + 13 = 79
	82	A1	
	Additional Guidance		
	39 + 33 + 13 = 85 (40 + 30 + 10 = 80)		M0
	Beware 82 from incorrect values, eg 39 + 24 + 19 = 82		M0A0
	Ignore incorrectly evaluated trials that do not solely lead to the answer		
25	$n - 1$	B1	
	Additional Guidance		

Question	Answer	Mark	Comments
26(a)	$\frac{1}{2}(b + 2b)h$ or $3 \times \frac{1}{2}bh$	M1	oe
	1.5bh or $\frac{3}{2}bh$ or $\frac{3bh}{2}$ or $1\frac{1}{2}\ bh$	A1	accept hb for bh
	Additional Guidance		
	Correct expression with ×, ÷ or brackets		M1A0
	Condone units within expressions for M1 only		
	Condone the expression given within a formula eg A = 1.5hb		M1A1
	Condone correct expression stated and then equated to a value or with values substituted		M1A1
26(b)	$3b + 2s$ or $3b = 2s$ or $4s$	M1	oe
	$6b$	A1	oe eg $b + b + b + b + b + b$
	Additional Guidance		
	Condone the expression given within a formula eg P = 6b		M1A1

Question	Answer	Mark	Comments
27	$\pi \times 6 \times 6$ or 36π or [113, 113.112] or $9 \times$ [3.14, 3.142] or [28.26, 28.3]	M1	oe accept [3.14, 3.142] for π
	9π or $9 \times \pi$ or $\pi 9$ or $\pi \times 9$	A1	
	Additional Guidance		
	36π followed by an incorrect method eg $36\pi \div 2 = 18\ \pi$ with answer $18\ \pi$		M1A0
	Answer of 9π from $\pi \times 3^2$		M0A0
	9π and [28.26, 28.3] given on answer line		M1A0
	πr^2 stated but followed by 36 or 9		M0A0
28a	1.25×10^4	B1	accept $10^4 \times 1.25$
	Additional Guidance		
	1.2×10^4 or 1.3×10^4		B0
28b	0.034	B1	accept $\frac{34}{1000}$ (oe fraction)
	Additional Guidance		
	If fraction given, ignore attempts to cancel		

Question	Answer	Mark	Comments
29	$((\sqrt{3})^2 =) 3$ and $((\sqrt{2})^2 =) 2$ or $(\sqrt{6})^2$ or $\sqrt{6^2}$ or $\sqrt{36}$ or $\sqrt{9} \times \sqrt{4}$ or $\sqrt{9 \times 4}$	M1	
	6	A1	
	Additional Guidance		
	$3 \times 2 = 6$ with answer eg $\sqrt{6}$ or 6^4		M0A0
	Condone $\sqrt{3} = 1.7$, $1.7^2 = 3$ and $\sqrt{2} = 1.4$, $1.4^2 = 2$, otherwise $\sqrt{3}$ or $\sqrt{2}$ or 3^2 or 2^2 incorrectly evaluated does not score even if answer is 6		
	eg $\sqrt{3} = 1.5$, $1.5^2 = 3$, answer 6		M0A0
	$\sqrt{2} = 1$, $1^2 = 2$		M0A0
	$3^2 = 6$, $\sqrt{6} = 3$		M0
	$\left(\sqrt{6}\right)^4$		M0A0
	$\sqrt{2} = 1$		M0

Question	Answer	Mark	Comments
30	**Alternative method 1**		
	$x + 2x + 2x + 10$ or $5x + 10$ or $x + 2x + 2x + 10 + 90$ or $5x + 100$	M1	oe
	$x + 2x + 2x + 10 = 360 - 90$ or $5x + 10 = 270$ or $x + 2x + 2x + 10 + 90 = 360$ or $5x + 100 = 360$ or $5x = 260$	M1dep	oe
	$(x =)$ 52 or $2x = 104$ or $2x + 10 = 114$	A1	may be on diagram
	$\frac{114}{360}$ or $\frac{57}{180}$ or $\frac{38}{120}$ or $\frac{19}{60}$ or 0.31(6..) or 0.317 or 0.32 or 31(.6…)% or 31.7% or 32%	B1ft	ft $\frac{2 \times \text{their } 52 + 10}{360}$ or $\frac{\text{their angle for C}}{360}$

Alternative method 2 is on the next page

Question	Answer	Mark	Comments
30 cont	**Alternative method 2**		
	$\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + P(C) = 1$ or $\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + \frac{2x+10}{360}$ or $\frac{2x+10}{5x+100}$	M1	oe
	$\frac{90}{360} + \frac{x}{360} + \frac{2x}{360} + \frac{2x+10}{360} = 1$	M1dep	oe
	$(x =)$ 52 or $2x = 104$ or $2x + 10 = 114$	A1	may be on diagram
	$\frac{114}{360}$ or $\frac{57}{180}$ or $\frac{38}{120}$ or $\frac{19}{60}$ or 0.31(6..) or 0.317 or 0.32 or 31(.6…)% or 31.7% or 32%	B1ft	ft $\frac{2 \times \text{their } 52 + 10}{360}$ or $\frac{\text{their angle for C}}{360}$
	Additional Guidance		
	Ignore incorrect simplification or conversion after $\frac{114}{360}$ oe		M1M1A1B1
	$\frac{360 - 10 - 90}{5}$ oe		M1M1
	$x + 2x + 2x + 10$ followed by $6x + 10 = 270$		M1M0
	Do not accept decimal within fraction for final answer if correct fraction not seen		
	The follow through is not available if A1 awarded		

Question	Answer	Mark	Comments

31(a)	$(x - 10)(x + 10)$	B1	either order ignore fw
	Additional Guidance		
	$(x + 10)(x + -10)$		B1
	Condone missing bracket at end only $(x - 10)(x + 10$ $(x - 10(x + 10)$		B1 B0
	$(x - 10)(x + 10)$ followed by attempt to solve, eg answer $x = 10$, $x = -10$		B1
	answer only $x = 10$, $x = -10$		B0

31(b)	$7x - 2x > 1 - 6$ or $5x > -5$ or $6 - 1 > 2x - 7x$ or $5 > -5x$ or $1 > -x$	M1	oe collecting terms
	$x > -1$ or $-1 < x$	A1	SC1 incorrect sign eg $x \geqslant -1$ or $x = -1$ or answer of –1
	Additional Guidance		
	Answer $x > \frac{-5}{5}$		M1A0
	Answer only $\frac{-5}{5}$		SC0
	$x > -1$ with -1 or 0, 1, 2, ….. as the answer		M1A0