GCSE
MATHEMATICS
8300/3F

Foundation Tier Paper 3 Calculator

Mark scheme

June 2020

Version 1.0 Final

206G8300/3F/MS

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 Examiner.

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.

Further copies of this mark scheme are available from aqa.org.uk

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 $\leqslant$ 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.

Q	Answer	Mark	Comments
1	6.28	B1	

Q	Answer	Mark	Comments
2	80	B1	

Q	Answer	Mark	Comments
3	$0.07 < 0.7$	B1	

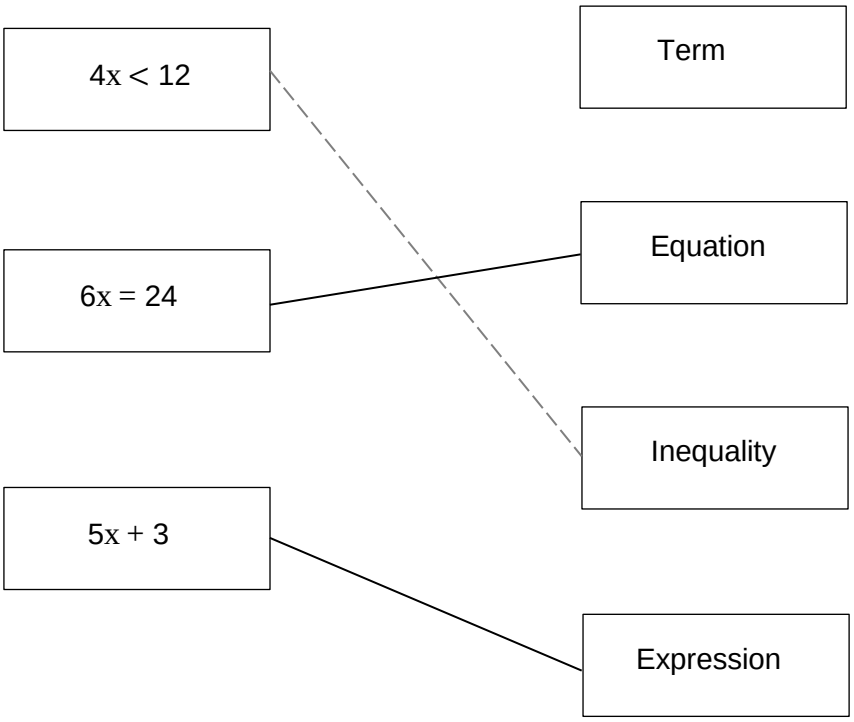
Q	Answer	Mark	Comments
4	A and C	B1	

Q	Answer	Mark	Comments
5(a)	35×8 or 38×5	B1	
	Additional Guidance		
	Ignore any answer to their calculation		
	Accept a correct response alone or selected in the working space if the answer box is blank or crossed out		

Q	Answer	Mark	Comments
5(b)	$5 \times 3 - 8$ or $3 \times 5 - 8$	B1	
	Additional Guidance		
	Ignore any answer to their calculation		
	Accept a correct response alone or selected in the working space if the answer box is blank or crossed out		

Q	Answer	Mark	Comments
5(c)	$\frac{6+5}{8+3} = 1$ or $\frac{6+5}{3+8} = 1$	B1	
	Additional Guidance		
	Accept a correct response alone or selected in the working space if the answer box is blank or crossed out		

Q	Answer	Mark	Comments
6	**Alternative method 1**		
	$267.5(0) - 125$ or $142.5(0)$	M1	oe
	$\frac{\text{their } 142.5(0)}{7.5(0)}$	M1dep	oe
	19	A1	
	Alternative method 2		
	$\frac{267.5(0)}{7.5(0)}$ or $35.\dot{6}$	M1	oe
	their $35.\dot{6} - \frac{125}{7.5(0)}$	M1dep	oe
	19	A1	
	Additional Guidance		
	Award M1 or M2 work even if not subsequently used		
	Build up methods to 142.5(0) score first M1 only unless fully correct		
	Build up methods from 125 score M0 unless fully correct		
	Accept $35.66\ldots$ or 35.67 for $35.\dot{6}$		

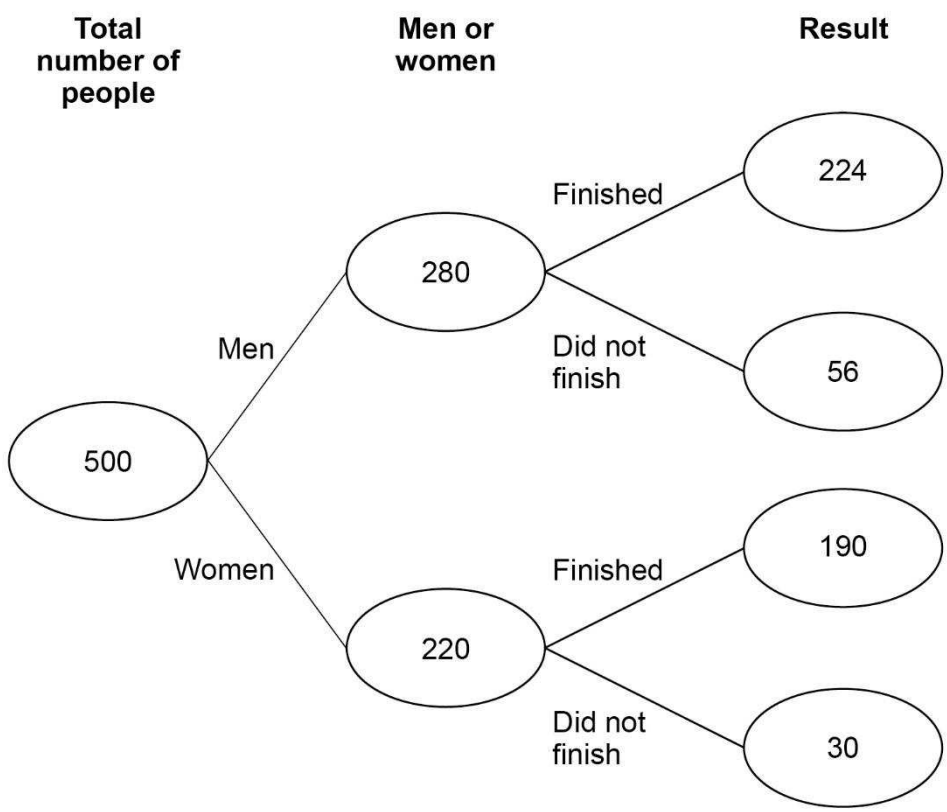
Q	Answer	Mark	Comments
7	Two correct matches	B2	B1 one correct match
	Additional Guidance		
	Do not accept two lines from an algebra box		
			B2

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="2">8</td><td>
<table>
<tr><td>A</td><td>E</td></tr>
<tr><td>A</td><td>R</td></tr>
<tr><td>A</td><td>T</td></tr>
<tr><td>L</td><td>E</td></tr>
<tr><td>L</td><td>R</td></tr>
<tr><td>L</td><td>T</td></tr>
</table>

with no extras</td><td>B2</td><td>B1 three additional correct teams with no errors or repetitions
or
four additional correct teams with at most one error or repetition
or
five additional correct teams with one or two errors or repetitions
SC1
<table>
<tr><td>A</td><td>E</td></tr>
<tr><td>E</td><td>A</td></tr>
<tr><td>E</td><td>L</td></tr>
<tr><td>R</td><td>A</td></tr>
<tr><td>R</td><td>L</td></tr>
<tr><td>T</td><td>A</td></tr>
<tr><td>T</td><td>L</td></tr>
</table>
or
<table>
<tr><td>AE</td><td>EA</td></tr>
<tr><td>AR</td><td>RA</td></tr>
<tr><td>AT</td><td>TA</td></tr>
<tr><td>LE</td><td>EL</td></tr>
<tr><td>LR</td><td>RL</td></tr>
<tr><td>LT</td><td>TL</td></tr>
<tr><td></td><td></td></tr>
</table>
</td></tr>
<tr><td colspan="3">
<table>
<tr><th colspan="2">Additional Guidance</th></tr>
<tr><td>Full names are acceptable</td><td></td></tr>
<tr><td>Condone repetition of AE</td><td></td></tr>
<tr><td>Rows can be in any order</td><td></td></tr>
<tr><td>Accept lower case letters</td><td></td></tr>
<tr><td>For B1 condone teams in either column</td><td></td></tr>
</table>
</td></tr>
</table>

Q	Answer	Mark	Comments
9	280 or 30 in correct position	B1	
	500 – 280 or 220	M1	
	0.8(0) × their 280 or 224 or 0.2(0) × their 280 or 56	M1	oe
	their 220 – their 30 or 190 or 280 – their 224 or 280 – their 56 or 0.8(0) × their 280 or 224 and 0.2(0) × their 280 or 56	M1	
	Fully correct frequency tree	A1	
	Additional Guidance		
	Allow relative frequencies with denominator of 500 for B1 or M marks		
	Mark the diagram first, values in diagram have priority over working		
	Correct values may be incorrectly placed for method marks		

Additional Guidance continues on the next page

Q	Additional Guidance continued
9 cont	

Q	Answer	Mark	Comments
10	1.8 × 1000 or 1800 or 1600 ÷ 1000 or 1.6 or $1\frac{3}{4}$ × 1000 or 1750 or 1.75	M1	
	Shortest distance 1600 (metres) ($1\frac{3}{4}$ (kilometres)) Longest distance 1.8 (kilometres) with no incorrect working	A1	any indication eg allow 1800 (metres) for 1.8 (kilometres)
	Additional Guidance		
	Award M1 work even if not subsequently used		
	Correct order with no incorrect working		M1A1
	Correct order with incorrect working can score up to M1 eg 0.16 1.75 1.8 eg 1600 17 500 18 000		M1A0 M0A0
	1.6 or 1.75 with order incorrect		M1A0
	1800 or 1750 with order incorrect		M1A0

Q	Answer	Mark	Comments
11	180 – 103 – 49	M1	oe
	28	A1	

Q	Answer	Mark	Comments
12(a)	360 – 75 – 165 or 120	M1	oe
	their 120 ÷ 4 or 30 or their 120 ÷ 4 × 3 or 90	M1dep	oe implied by one correctly drawn angle in pie chart ± 2°
	30° sector labelled Green or G and 90° sector labelled Red or R	A1	± 2° line must be ruled
	Additional Guidance		
	Both sectors must be correctly labelled with letters or words for the accuracy mark		

Q	Answer	Mark	Comments
12(b)	$\frac{75}{360}$ or $\frac{360}{75}$ or $\frac{600}{360}$ or $\frac{360}{600}$	M1	oe eg 75 ÷ 360 eg 0.208… or 0.21 or 4.8 or 1.66… or 1.67 or 0.6
	125	A1	
	Additional Guidance		
	125 out of 600		M1A1
	$\frac{125}{600}$		M1A0

Q	Answer	Mark	Comments
13	**Alternative method 1**		
	2.8(0) ÷ 0.2(0) or 14	M1	oe eg 280 ÷ 20
	their 14 × 0.5(0) or 7(.00) or their 14 × (0.5(0) + 0.2(0)) or their 14 × 0.7(0) or 9.8	M1dep	oe eg 14 × 50 or 700 or 14 × 70 or 980
	9.80	A1	
	Alternative method 2		
	50 ÷ 20 or 2.5	M1	oe
	their 2.5 × 2.8(0) or 7(.00) or (1 + their 2.5) × 2.8(0) or 9.8	M1dep	oe eg their 2.5 × 280 or 700 or 980
	9.80	A1	

Q	Answer	Mark	Comments
14(a)	$3 \times 48 + 4 \times 26$ or $144 + 104$ or 248	M1	oe
	Any combination of ticket prices for 3 adults and 4 children involving at least one special offer	M1	oe eg $120 + 82$ or 202 or $2 \times 82 + 48$ or $164 + 48$ or 212 or $120 + 48 + 2 \times 26$ or $120 + 48 + 52$ or 220 or $82 + 2 \times 48 + 2 \times 26$ or $82 + 96 + 52$ or 230
	their 248 – their combination total for 3 adults and 4 children	M1dep	oe eg $248 - 120 - 82$ if fully correct or $248 - 212$ or 36 or $248 - 220$ or 28 or $248 - 230$ or 18 dep on second M mark
	46	A1	
	Additional Guidance		
	Award M1, M2 or M3 work even if not subsequently used		
	If no correct working is shown for the first M mark then their 248 must be a value of 148 or greater		

Q	Answer	Mark	Comments
14(b)	$48 \times \frac{1}{4}$ or 12 or $5 \times 48 \times \frac{1}{4}$ or 60	M1	oe implied by $48 \times \left(1-\frac{1}{4}\right)$ or 36
	$5 \times 48 - 5 \times 48 \times \frac{1}{4}$ or $240 - 60$	M1dep	oe eg $5 \times 48 \times \frac{3}{4}$ or $240 \times \frac{3}{4}$ or 5×36
	180	A1	
	Additional Guidance		
	180 and $240 - 180 = 60$		M1M1A0

Q	Answer	Mark	Comments
15	n^2	B1	

Q	Answer	Mark	Comments
16(a)	Correct ruled straight line through (0, 0) and (20, 72)	B2	$\pm \frac{1}{2}$ square B1 any one correct coordinate plotted or seen in a table of values with $1 \leqslant x \leqslant 20$ eg (1, 3.6) (2, 7.2) (3, 10.8) (4, 14.4) (5, 18) (10, 36) (15, 54) or (20, 72)
	Additional Guidance		
	Ignore lines beyond (0, 0) to (20, 72)		
	Ignore incorrect points plotted		
	To award B1, points plotted cannot be implied by an incorrect line, there must be a coordinate plotted or values in a table		
	Correct ruled line but too short		B1

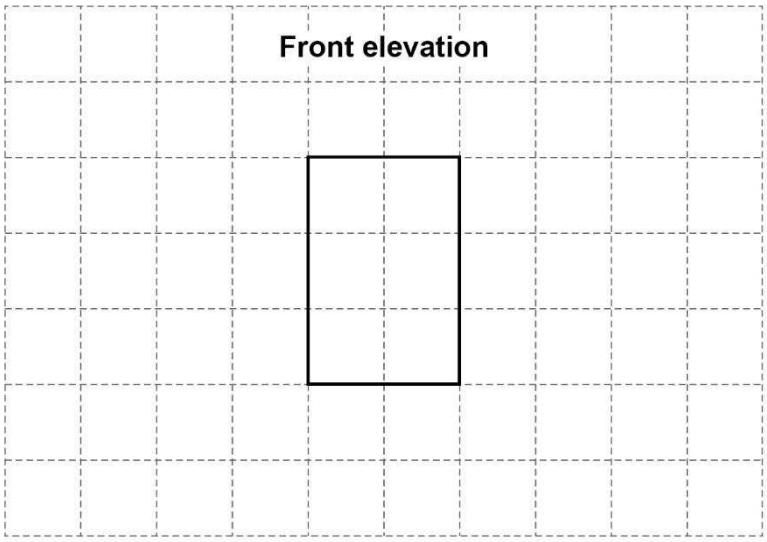
Q	Answer	Mark	Comments
16(b)	14	B1ft	ft from their graph in part (a) $\pm \frac{1}{2}$ square
	Additional Guidance		
	Answer must be a whole number		

Q	Answer	Mark	Comments	
16(c)	**Alternative method 1** (using formula and conversion factor)			
	30 × 3.6 or 108 or 30 ÷ 1.61 or [18.6, 18.64] or 3.6 ÷ 1.61 or [2.2, 2.24] or 1.61 ÷ 3.6 or [0.4, 0.45]	M1	oe working in metres eg 30 × 60 × 60 or 108 000	
	their 108 ÷ 1.61 or their [18.6, 18.64] × 3.6 or their [2.2, 2.24] × 30 or 30 ÷ their [0.4, 0.45]	M1dep	oe working in metres eg 108 000 ÷ 1610	
	[67, 67.1]	A1	[67, 67.1]	
	Alternative method 2 (using graph and conversion factor)			
	Uses their graph to convert 30 m/s to km/h or 108	M1	eg 3 × (their y at x = 10) or (their y at x = 10) + (their y at x = 20) $\pm \frac{1}{2}$ square	
	their 108 ÷ 1.61	M1dep		
	[67, 67.1]	A1ft	ft from their graph in part (a) and M2	
	Additional Guidance			
	Alt 2 For A1ft answers may be rounded to the nearest integer or rounded to 1 decimal place eg their graph used correctly gives 114 km/h 114 ÷ 1.61 [70.8, 71]			M1 M1dep A1ft

Q	Answer	Mark	Comments
17(a)	1×5 and 2×6 and 3×8 and 4×2 and 5×4 or 5 and 12 and 24 and 8 and 20 or 69	M1	allow one error
	$(5 + 12 + 24 + 8 + 20) \div 25$ or $69 \div 25$ or their $69 \div 25$	M1dep	without working their 69 must be the correct sum of their products
	2.76	A1	oe
	Additional Guidance		
	Five products or values must be seen for first M1		
	Ignore attempt to round after 2.76 seen		M1M1A1
	$69 \div 5$		M1M0
	$5 + 12 + 24 + 8 + 20 \div 25$ unless recovered		M1M0
	Correct products seen with $25 \div 5$ or $25 \div 15$ or $15 \div 5$		M0

Q	Answer	Mark	Comments
17(b)	$5 + 6 + 8$ or $25 - (4 + 2)$ or 19 or $1 - \frac{4+2}{25}$	M1	oe
	$\frac{19}{25}$ or 0.76 or 76%	A1	oe
	Additional Guidance		
	Ignore attempts to simplify or convert a correct fraction		
	Ignore probability words		
	19 out of 25 or 19 in 25 alone on the answer line with a correct answer in working		M1A1
	19 out of 25 or 19 in 25 together with a correct answer on the answer line		M1A1
	19 : 25 with a correct answer together on the answer line		M1A0

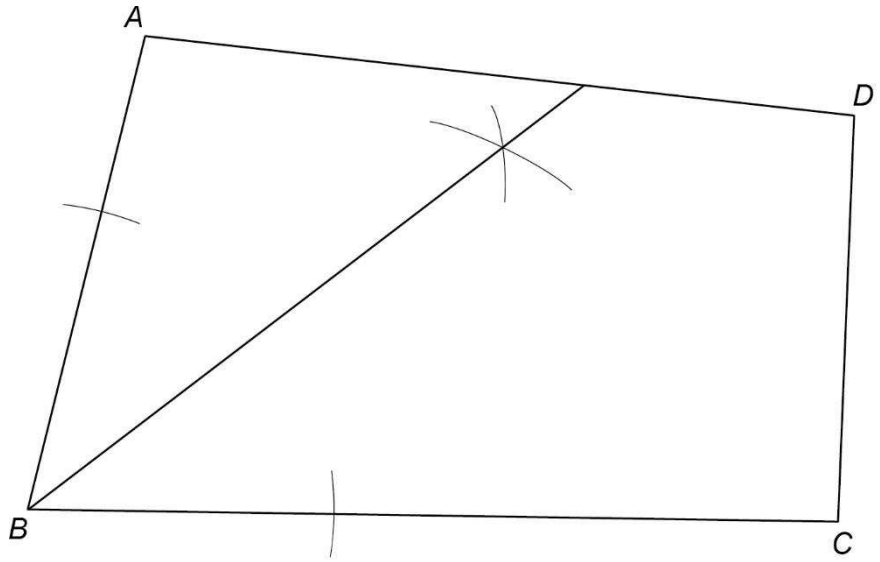
Q	Answer	Mark	Comments
18	$10 \times x$ or $10x$	M1	oe
	$T = 15 + 10x$	A1	oe eg $T = 10x + 15$ allow $T = 15 + 10 \times x$
	Additional Guidance		
	Condone $x10$ for $10x$ for M mark		
	Ignore units		
	$15 + 10x = T$		M1A1
	Condone a correct rearrangement after $T = 15 + 10x$ seen eg $T - 15 = 10x$ or $x = \frac{T-15}{10}$		M1A1
	Do not ignore further incorrect working eg $T = 15 + 10x$ and $T = 25x$		M1A0
	$T = 5 \times 3 + 10 \times x$		M1A0
	$15 + 10x$		M1A0

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="4">19</td><td>Rectangle with height 3 and width 2</td><td>B2</td><td>any position on the grid
B1 rectangle with height 3 or width 2
or rectangle with height 2 and width 3
or cuboid with rectangular front face height 3 and width 2</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Accept unruled lines</td><td></td></tr>
<tr><td colspan="2"> 
</td><td>B2</td></tr>
</table>

Q	Answer	Mark	Comments
20(a)	17 500	B1	
	Additional Guidance		
	Accept response in words		

Q	Answer	Mark	Comments
20(b)	18 499	B1	
	Additional Guidance		
	Accept response in words		
	$18\,499.\dot{9}$ or $18\,49\dot{9}$		B0

Q	Answer	Mark	Comments
21	$y = 5x - 2$	B1	

Q	Answer	Mark	Comments
22	Two arcs of equal radius or a single arc, centre B, cutting BA and BC or a single arc cutting BC with radius = BA	M1	± 2 mm ± 2 mm
	Fully correct method of construction of bisector of angle ABC	A1	
	Additional Guidance		
	Award M1 if correct arc(s) seen alongside incorrect arc(s)		
	Angle bisector does not need to meet AD and ignore angle bisector extended beyond AD		
	Accept an arc touching the line BA or BC		
	No arcs seen on BC		M0
			

Q	Answer	Mark	Comments
23	2 : 1	B1	

Q	Answer	Mark	Comments
24	32^2 and 60^2 or 1024 and 3600 or 4624	M1	
	$\sqrt{32^2+60^2}$ or $\sqrt{1024+3600}$ or $\sqrt{4624}$	M1dep	
	68	A1	
	Additional Guidance		
	Answer only 68		M1M1A1
	68 = $2\sqrt{17}$ incorrect further working		M1M1A0
	68 from scale drawing		M0M0A0
	68 from trigonometry		M0M0A0

Q	Answer	Mark	Comments
25	**Alternative method 1**		
	$12 \times \frac{30}{60}$ or $12 \times \frac{1}{2}$ or 6	M1	oe eg $12 \div 2$
	$135 - 90$ or 45	M1	oe eg $\frac{3}{4}$
	8	A1	
	Alternative method 2		
	$\frac{30}{135-90}$ or $\frac{30}{45}$ or $\frac{2}{3}$ or $\frac{135-90}{30}$ or $\frac{45}{30}$ or $\frac{3}{2}$	M1	oe eg $30 : (135 - 90)$ or $30 : 45$ or $2 : 3$ or $(135 - 90) : 30$ or $45 : 30$ or $3 : 2$
	$12 \times \frac{30}{135-90}$	M1dep	oe eg $\frac{12 \times 30}{45}$ eg $12 \div \frac{3}{2}$
	8	A1	
	Additional Guidance		
	Award M1 or M2 work even if not subsequently used		
	Check diagram for working		
	0.133… implies M1M1		
	$12 \div 3 = 4$ and $12 - 4 = 8$		M2A1
	Answer -8		M2A0
	Ignore units unless 6 or 45 is from clearly incorrect working eg 12 (mph) = 60 minutes 6 (mph) = 30 minutes eg 12 (mph) = 30 minutes 6 (mph) = 15 minutes		M1 M0

Q	Answer	Mark	Comments
26	$\frac{16}{20}$ or $\frac{20}{16}$ or $\frac{12}{20}$ or $\frac{20}{12}$ or 12 : 9.6 or 9.6 : 12 or 16 : 9.6 or 9.6 : 16	M1	oe eg 16 ÷ 20 eg $\frac{4}{5}$ or $\frac{5}{4}$ or $\frac{3}{5}$ or $\frac{5}{3}$ eg 0.8 or 1.25 or 0.6 or 1.66… or 1.67
	9.6	A1	oe
	Additional Guidance		
	Award M1 work even if not subsequently used		
	Ignore further working in an attempt to round after answer 9.6 eg 9.6 in working with answer 10		M1A1
	12 × 20 ÷ 16		M1

Q	Answer	Mark	Comments
27	$x^2 - 2x + 1$	B1	

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="8">28</td><td>$a = 2$ and $b = 4$ and $c = 5$
or
$a = 4$ and $b = 2$ and $c = 5$
or
$a = 0$ and $b = 6$ and $c = 5$</td><td>B3</td><td>B2 $a + b = 6$ with integer values of $a \geqslant 0$ and $b \geqslant 1$
B1 $c = 5$
or
$a + b + c = 11$ with integer values of $a \geqslant 0$ and $b \geqslant 0$ and $c \geqslant 0$
or
13th value = 3 and 14th value = 4 stated
or
correct median position indicated on a list</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Values may be seen alongside or in the table</td><td></td></tr>
<tr><td colspan="2">Blank answer line does not indicate zero for that value
eg $a =$ _____ $b = 6$ $c = 5$</td><td>B1</td></tr>
<tr><td colspan="2">$a = 2$ $b = 6$ $c = 5$</td><td>B1</td></tr>
<tr><td colspan="2">$a = 11$ $b = 0$ $c = 0$</td><td>B1</td></tr>
<tr><td colspan="2">$a = 6$ $b = 0$ $c = 5$</td><td>B1</td></tr>
<tr><td colspan="2">$a = 6$ $b = 0$ $c = 3$</td><td>B0</td></tr>
</table>

Q	Answer	Mark	Comments
29	**Alternative method 1**		
	60 × (1 – 0.15) or 60 × 0.85 or 51 or 40 × (1 – 0.1) or 40 × 0.9 or 36	M1	oe 60 × 0.15 or 9 or 40 × 0.1 or 4
	2 × their 51 + 2 × their 36 or 174	M1dep	oe 2 × their 9 + 2 × their 4 or 26 their 51, their 36, their 9 and their 4 must come from a correct method
	(2 × 60 + 2 × 40) × 0.75 or 200 × 0.75 or 150 or (2 × 60 + 2 × 40) × 0.25 or 200 × 0.25 or 50	M1	oe
	174 and 150 and No or 224 and 200 and No or 26 and 50 and No	A1	SC3 176 and 150 and No or 226 and 200 and No or 24 and 50 and No

Mark Scheme and Additional Guidance continue on the next page

Q	Answer	Mark	Comments
29 cont	**Alternative method 2**		
	$60 \times (1 - 0.15)$ or 60×0.85 or 51 or $40 \times (1 - 0.1)$ or 40×0.9 or 36	M1	oe 60×0.15 or 9 or 40×0.1 or 4
	$2 \times$ their 51 + $2 \times$ their 36 or 174	M1dep	oe $2 \times$ their 9 + $2 \times$ their 4 or 26 their 51, their 36, their 9 and their 4 must come from a correct method
	$\frac{(2\times 60 + 2\times 40) - \text{their } 174}{2\times 60 + 2\times 40} \times 100$ or $\frac{200 - \text{their } 174}{200} \times 100$ or 13(%) or $\frac{174}{200} \times 100$ and $100 - 25$ or 87(%) and 75(%)	M1dep	oe $\frac{2\times \text{their } 9 + 2\times \text{their } 4}{200} \times 100$ or $\frac{26}{200} \times 100$ or 13(%) or $\frac{200 - (2\times \text{their } 9 + 2\times \text{their } 4)}{200} \times 100$ and 100(%) – 25(%) or 87(%) and 75(%)
	13% and No or 87% and 75% and No	A1	oe SC3 12% and No or 88% and 75% and No
	Additional Guidance		
	Ignore incorrect statements or calculations with full mark response		
	Consistently working with half of a perimeter can score up to 4 marks		
	SC3 must come from transposing length and width values		
	Accept length and width values transposed for up to 3 marks eg 60×0.9 with 40×0.85 and $2 \times 54 + 2 \times 34$ eg 60×0.9 with 40×0.9 and $2 \times 54 + 2 \times 36$ (not transposed) eg 60×0.1 or 40×0.15 or 6		M1M1 M1M0 M1

Q	Answer	Mark	Comments
30	$8c + 12$ or $-5c + 1$	M1	may be seen in a grid implied by $3c + 12 + 1$ or $8c + 13 - 5c$
	$3c + 13$	A1	
	Additional Guidance		
	Do not ignore further working eg $3c + 13 = 16c$ eg $3c + 13$, $c = \frac{-13}{3}$		M1A0 M1A0
	$8c + 12 - 5c - 1$		M1
	$8c + 3 - 5c + 1$		M1

Q	Answer	Mark	Comments
31	$(4\mathbf{c} =) \begin{pmatrix} 16 \\ 36 \end{pmatrix}$ or $(3\mathbf{d} =) \begin{pmatrix} 6 \\ -15 \end{pmatrix}$ or $(\text{answer} =) \begin{pmatrix} 22 \\ ... \end{pmatrix}$ or $(\text{answer} =) \begin{pmatrix} ... \\ 21 \end{pmatrix}$	M1	
	$\begin{pmatrix} 22 \\ 21 \end{pmatrix}$	A1	

Additional Guidance	
Condone missing brackets and divisor lines for M mark	
Must see $\begin{pmatrix} 22 \\ 21 \end{pmatrix}$ to award the A mark, condone divisor line	
Condone vectors written as coordinates eg (16, 36) eg (22, …)	 M1 M1
Allow 16 36 or 6 –15	M1
36 16 or –15 6	M0
22 not indicated as x component or 21 not indicated as y component without other work for M1	M0