

**GCSE
MATHEMATICS
8300/3F**

Foundation Tier Paper 3 Calculator

Mark scheme

June 2020

Version 1.0 Final



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.

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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 $a \leq \text{value} < b$
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	

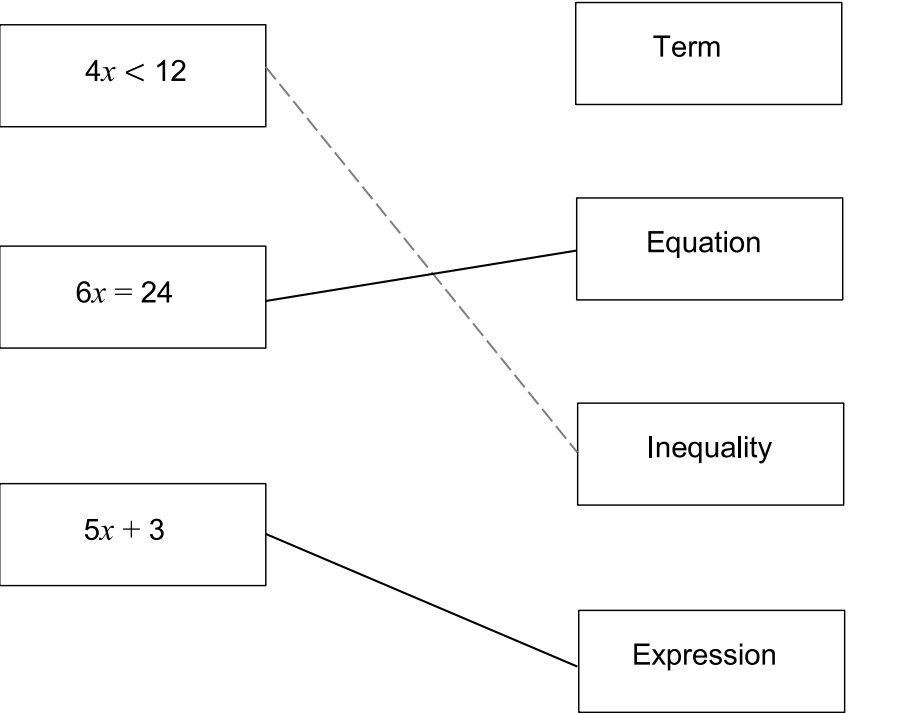
Q	Answer	Mark	Comments
4	A and C	B1	

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 $35.66\dots$ 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		
	 <p>The diagram illustrates the classification of three algebraic expressions. On the left, there are three boxes containing the expressions $4x < 12$, $6x = 24$, and $5x + 3$. On the right, there are four boxes containing the labels Term, Equation, Inequality, and Expression. Solid lines connect $6x = 24$ to Equation and $5x + 3$ to Expression. A dashed line connects $4x < 12$ to Inequality. The label Term is not connected to any of the expressions.</p>		

Q	Answer	Mark	Comments																																													
8	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td style="padding: 2px;">A</td><td style="padding: 2px;">E</td></tr> <tr><td style="padding: 2px;">A</td><td style="padding: 2px;">R</td></tr> <tr><td style="padding: 2px;">A</td><td style="padding: 2px;">T</td></tr> <tr><td style="padding: 2px;">L</td><td style="padding: 2px;">E</td></tr> <tr><td style="padding: 2px;">L</td><td style="padding: 2px;">R</td></tr> <tr><td style="padding: 2px;">L</td><td style="padding: 2px;">T</td></tr> </table> <p style="margin-left: 40px;">with no extras</p>	A	E	A	R	A	T	L	E	L	R	L	T	B2	<p>B1 three additional correct teams with no errors or repetitions</p> <p>or</p> <p>four additional correct teams with at most one error or repetition</p> <p>or</p> <p>five additional correct teams with one or two errors or repetitions</p> <p>SC1</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td style="padding: 2px;">A</td><td style="padding: 2px;">E</td><td rowspan="8" style="padding: 0 10px;">or</td><td style="padding: 2px;">AE</td><td style="padding: 2px;">EA</td></tr> <tr><td style="padding: 2px;">E</td><td style="padding: 2px;">A</td><td style="padding: 2px;">AR</td><td style="padding: 2px;">RA</td></tr> <tr><td style="padding: 2px;">E</td><td style="padding: 2px;">L</td><td style="padding: 2px;">AT</td><td style="padding: 2px;">TA</td></tr> <tr><td style="padding: 2px;">R</td><td style="padding: 2px;">A</td><td style="padding: 2px;">LE</td><td style="padding: 2px;">EL</td></tr> <tr><td style="padding: 2px;">R</td><td style="padding: 2px;">L</td><td style="padding: 2px;">LR</td><td style="padding: 2px;">RL</td></tr> <tr><td style="padding: 2px;">T</td><td style="padding: 2px;">A</td><td style="padding: 2px;">LT</td><td style="padding: 2px;">TL</td></tr> <tr><td style="padding: 2px;">T</td><td style="padding: 2px;">L</td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table>	A	E	or	AE	EA	E	A	AR	RA	E	L	AT	TA	R	A	LE	EL	R	L	LR	RL	T	A	LT	TL	T	L						
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T	L																																															
Additional Guidance																																																
Full names are acceptable																																																
Condone repetition of AE																																																
Rows can be in any order																																																
Accept lower case letters																																																
For B1 condone teams in either column																																																

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	<table border="0"><thead><tr><th data-bbox="304 439 453 533">Total number of people</th><th data-bbox="663 439 770 499">Men or women</th><th data-bbox="1070 439 1166 465">Result</th></tr></thead><tbody><tr><td data-bbox="277 824 480 943">500</td><td data-bbox="485 757 544 786">Men</td><td data-bbox="616 633 818 752">280</td></tr><tr><td></td><td data-bbox="440 976 544 1005">Women</td><td data-bbox="616 1010 818 1128">220</td></tr><tr><td></td><td></td><td data-bbox="823 600 938 629">Finished</td></tr><tr><td></td><td></td><td data-bbox="1018 566 1220 651">224</td></tr><tr><td></td><td></td><td data-bbox="823 752 938 813">Did not finish</td></tr><tr><td></td><td></td><td data-bbox="1018 734 1220 842">56</td></tr><tr><td></td><td></td><td data-bbox="823 976 938 1005">Finished</td></tr><tr><td></td><td></td><td data-bbox="1018 920 1220 1028">190</td></tr><tr><td></td><td></td><td data-bbox="823 1128 938 1189">Did not finish</td></tr><tr><td></td><td></td><td data-bbox="1018 1111 1220 1218">30</td></tr></tbody></table>	Total number of people	Men or women	Result	500	Men	280		Women	220			Finished			224			Did not finish			56			Finished			190			Did not finish			30
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		30																																

Q	Answer	Mark	Comments
10	1.8×1000 or 1800 or $1600 \div 1000$ or 1.6 or $1\frac{3}{4} \times 1000$ 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 17500 18000		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 $120 \div 4$ or 30 or their $120 \div 4 \times 3$ or 90	M1dep	oe implied by one correctly drawn angle in pie chart $\pm 2^\circ$
	30° sector labelled Green or G and 90° sector labelled Red or R	A1	$\pm 2^\circ$ 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 $75 \div 360$ 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 $240 - 180 = 60$		

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 $1 \leq x \leq 20$ 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		

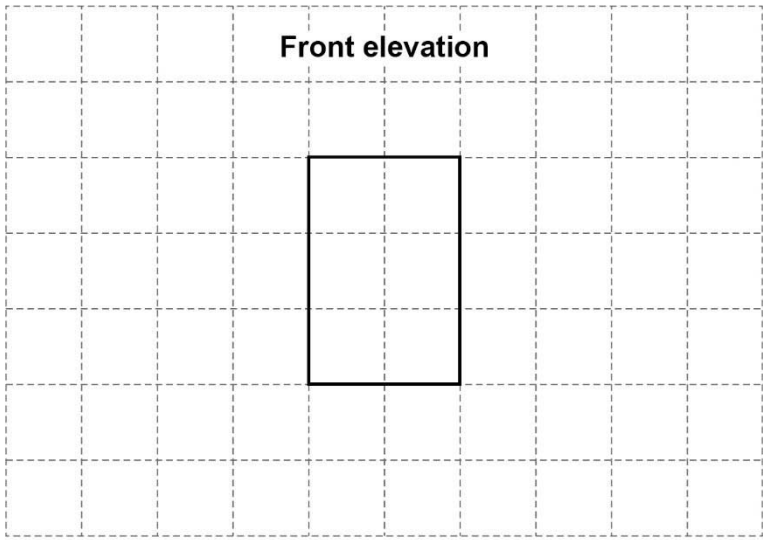
Q	Answer	Mark	Comments	
16(b)	14	B1ft	ft from their graph in part (a) $\pm \frac{1}{2}$ square	
	Additional Guidance			
	Answer must be a whole number			

Q	Answer	Mark	Comments
16(c)	Alternative method 1 (using formula and conversion factor)		
	30×3.6 or 108 or $30 \div 1.61$ or [18.6, 18.64] or $3.6 \div 1.61$ or [2.2, 2.24] or $1.61 \div 3.6$ or [0.4, 0.45]	M1	oe working in metres eg $30 \times 60 \times 60$ or 108 000
	their $108 \div 1.61$ or their [18.6, 18.64] $\times 3.6$ or their [2.2, 2.24] $\times 30$ or $30 \div$ their [0.4, 0.45]	M1dep	oe working in metres eg $108\,000 \div 1610$
	[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 $3 \times$ (their y at $x = 10$) or (their y at $x = 10$) + (their y at $x = 20$) $\pm \frac{1}{2}$ square
	their $108 \div 1.61$	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 $114 \div 1.61$ [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	

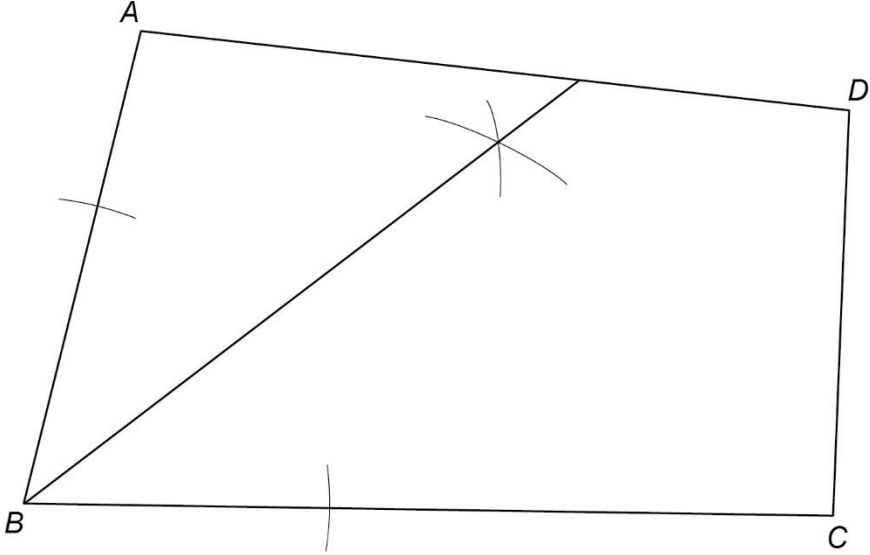
Q	Answer	Mark	Comments
18	$10 \times x$ or $10x$	M1	oe
	$T = 15 + 10x$	A1	oe eg $T = 10x + 15$ allow $T = 15 + 10 \times x$
	Additional Guidance		
	Condone $x10$ for $10x$ for M mark		
	Ignore units		
	$15 + 10x = T$		M1A1
	Condone a correct rearrangement after $T = 15 + 10x$ seen eg $T - 15 = 10x$ or $x = \frac{T - 15}{10}$		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	

Q	Answer	Mark	Comments
19	Rectangle with height 3 and width 2	B2	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
	Additional Guidance		
	Accept unruled lines		
	 <p style="text-align: center;">Front elevation</p>	B2	

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		
	$18499.\dot{9}$ or $1849\dot{9}$		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 $12 \text{ (mph)} = 60 \text{ minutes}$ $6 \text{ (mph)} = 30 \text{ minutes}$ eg $12 \text{ (mph)} = 30 \text{ minutes}$ $6 \text{ (mph)} = 15 \text{ minutes}$		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 $16 \div 20$ 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
	$12 \times 20 \div 16$		M1	

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

Q	Answer	Mark	Comments
28	$a = 2$ and $b = 4$ and $c = 5$ or $a = 4$ and $b = 2$ and $c = 5$ or $a = 0$ and $b = 6$ and $c = 5$	B3	B2 $a + b = 6$ with integer values of $a \geq 0$ and $b \geq 1$ B1 $c = 5$ or $a + b + c = 11$ with integer values of $a \geq 0$ and $b \geq 0$ and $c \geq 0$ or 13th value = 3 and 14th value = 4 stated or correct median position indicated on a list
	Additional Guidance		
	Values may be seen alongside or in the table		
	Blank answer line does not indicate zero for that value eg $a = \underline{\quad}$ $b = 6$ $c = 5$		B1
	$a = 2$ $b = 6$ $c = 5$		B1
	$a = 11$ $b = 0$ $c = 0$		B1
	$a = 6$ $b = 0$ $c = 5$		B1
	$a = 6$ $b = 0$ $c = 3$		B0

Q	Answer	Mark	Comments
29	Alternative method 1		
	$60 \times (1 - 0.15)$ 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
	$2 \times \text{their } 51 + 2 \times \text{their } 36$ or 174	M1dep	oe $2 \times \text{their } 9 + 2 \times \text{their } 4$ or 26 their 51, their 36, their 9 and their 4 must come from a correct method
	$(2 \times 60 + 2 \times 40) \times 0.75$ or 200×0.75 or 150 or $(2 \times 60 + 2 \times 40) \times 0.25$ 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
	$2 \times \text{their } 51 + 2 \times \text{their } 36$ or 174	M1dep	oe $2 \times \text{their } 9 + 2 \times \text{their } 4$ 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 $(\text{answer} =) \begin{pmatrix} 22 \\ \dots \end{pmatrix}$ or $(\text{answer} =) \begin{pmatrix} \dots \\ 21 \end{pmatrix}$	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	