GCSE MATHEMATICS 8300/2F

Foundation Tier Paper 2 Calculator

Mark scheme

November 2025

Version: 1.0 Final

25BG8300/2F/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.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

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

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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 $\leqslant$ 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

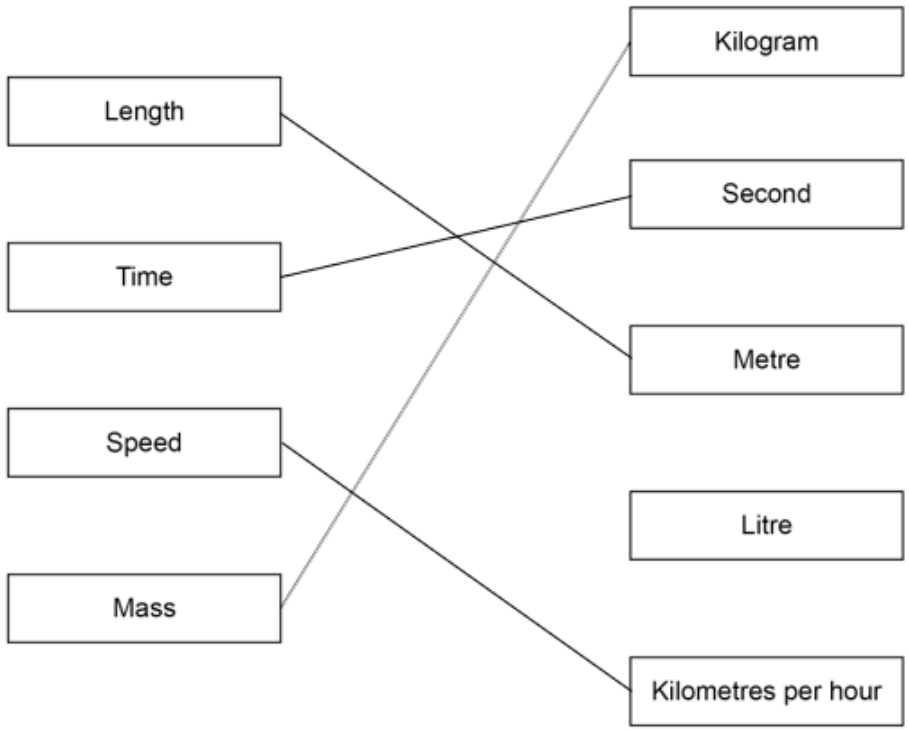
Erased or crossed out work that has been replaced is not awarded marks.

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	Fully correct	B2	B1 one or two correct
	Additional Guidance		
			
	Accept any unambiguous indication		
	Mark intention		
	More than one line from a box on the left is incorrect for that box		
	Ignore an additional line from Mass		

Q	Answer	Mark	Comments
2(a)	(2, 3)	B1	
	Additional Guidance		
	Condone x and y written above the coordinates		
	Do not condone $(2x, 3y)$		

Q	Answer	Mark	Comments
2(b)	8	B1	
	Additional Guidance		
	If answer line is blank check diagram for 8		

Q	Answer	Mark	Comments
3(a)	34	B1	
	Additional Guidance		
	Ignore further terms		

Q	Answer	Mark	Comments
3(b)	-4	B1	
	Additional Guidance		
	Ignore further terms		

Q	Answer	Mark	Comments
3(c)	15	B1	
	Additional Guidance		
	Ignore further terms		

Q	Answer	Mark	Comments
4	True False True	B2	B1 for one or two correct
	Additional Guidance		
	Accept any indication, but if a tick and a cross are used in the same row, mark the tick		
	A row with more than one tick is incorrect for that row		

Q	Answer	Mark	Comments
5	$\frac{7}{100}$ or 0.07 or 7%	B1	oe fraction
	Additional Guidance		
	Ignore incorrect simplification or conversion of a correct probability to a fraction, decimal or percentage but not to a ratio eg1 $\frac{7}{100}$ 0.7 eg2 $\frac{7}{100}$ 7 : 100	B1 B0	
	Ignore words alongside a correct probability eg1 $\frac{7}{100}$ likely eg2 7 out of 100 $\frac{7}{100}$	B1 B1	
	Answer only given in words eg 7 out of 100	B0	
	Answer given as a ratio eg 7 : 100	B0	

Q	Answer	Mark	Comments
6	Correct rectangle in correct position	B2	B1 correct rectangle 4 squares right or correct rectangle 2 squares down or correct rectangle 4 squares left and 2 squares up
	Additional Guidance		
	Mark intention for straight lines		
	Mark intention for position of vertices		
	For B1, must be the correct rectangle in the correct orientation		

Q	Answer	Mark	Comments
7(a)	87.5 or $87\frac{1}{2}$	B1	
	$\frac{3}{2}$ or $1\frac{1}{2}$	B1	oe fraction or mixed number
	Additional Guidance		
	Mark the table		
	For the second row, ignore cancelling from a correct fraction eg $\frac{150}{100}=\frac{3}{4}$ is awarded B1 for initial correct fraction		
	Ignore trailing zeros eg 87.50		

Q	Answer	Mark	Comments
7(b)	2, 3, 5, 7	B2	B1 2, 3, 5, 7 with one extra number or three of 2, 3, 5, 7 with no more than one other number or two of 2, 3, 5, 7 with no more than two other numbers
	Additional Guidance		
	No additional values allowed for B2		
	Numbers can be in any order		

Q	Answer	Mark	Comments
8	2.5(0) ÷ 2 or 1.25 or 4 × 2.5(0) or 10	M1	oe
	4 × 2.5(0) ÷ 2 or 5	M1dep	oe
	2 × 1.6(0) or 3.2(0)	M1	oe 8.2 or 820 is awarded M3
	8.20	A1	SC2 6.6(0)
	Additional Guidance		
	Up to M3 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts		
	Allow working in pence		
	SC2 is for finding the total discount and may be seen in the working		
	Answer 8.20p Answer 820p with £ sign crossed out Answer 820p without £ sign crossed out		M3A1 M3A1 M3A0

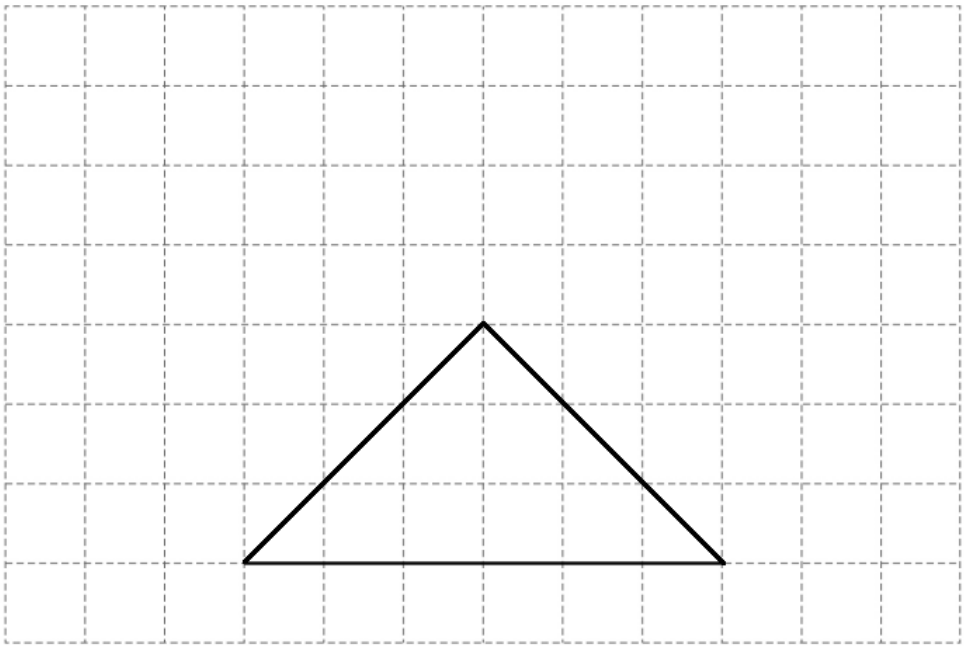
Q	Answer	Mark	Comments	
9	9 × 42 or 378 or 9 × (0).42 or 3.78	M1	oe	
	530 – their 378 or 152 or 5.3(0) – their 3.78 or 1.52	M1	oe 42 ⩽ their 378 < 530 (0).42 ⩽ their 3.78 < 5.3(0) 152 or 1.52 implies M2 530 ÷ 4 – 42 × 9 ÷ 4 implies M2	
	38	A1	SC2 40(.2…) SC1 0.40(2...)	
	Additional Guidance			
	Up to M2 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts			
	The SC is from using 4 apples and 9 oranges			
	Answer must be in pence (£) (0).38			M1M1A0
	38 followed by further work			M1M1A0
	5.3(0) – 378 unless recovered			M1M0
	42 ÷ 9 = 4.66 or 4.67 followed by 5.3(0) – 4.66 or 5.3(0) – 4.67			M0 M1

Q	Answer	Mark	Comments
10	**Alternative method 1**		
	0.2 × 120 or 24	M1	oe eg 12 + 12
	their 24 × 4 or 96	M1	oe 120 – 24 is awarded M1M1
	11	A1	
	Alternative method 2		
	120 × 4 or 480	M1	oe
	0.2 × their 480 or 96	M1	oe 48 + 48 is awarded M1M1
	11	A1	
	Alternative method 3		
	0.2 × 120 or 24	M1	oe eg 12 + 12
	their 24 – 85 ÷ 4 or their 24 – 21.25 or 2.75	M1	oe their 24 must be greater than 21.25
	11	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Condone eg in alt 1: 120 × 20%		M1
	Do not accept 'of' for '×' eg in Alt 1: 20% of 120 with no further correct method		M0

Q	Answer	Mark	Comments
11(a)	turn right	B1	

Q	Answer	Mark	Comments
11(b)	35 : 18 : 1 or any multiple of these values	B2	B1 3.5 : 1.8 : 0.1 oe with 1 (or more) non-integer value(s) or two correct values in a ratio as whole numbers eg 105 : 54 : 30
	Additional Guidance		
	Mark the answer line unless blank		
	Answer given as fractions eg $\frac{7}{2} : \frac{9}{5} : \frac{1}{10}$		B1
	B2 or B1 response with percentages on answer line is awarded B1 eg 35% : 18% : 1% eg 350% : 18% : 10%		B1 B1

Q	Answer	Mark	Comments	
12	**Alternative method 1: numerical approach**			
	30 ÷ 3 or 10	M1	oe	
	their 10 ÷ 2 or 5	M1	oe their 10 must be less than 30	
	45	A1		
	Alternative method 2: algebraic approach			
	$b = \frac{c}{3}$ or $b = c \div 3$ or $3b = c$ or $a = \frac{b}{2}$ or $a = b \div 2$ or $b = 2a$	M1		
	$a = \frac{c}{6}$ or $c = 3b$ and $a = \frac{b}{2}$ and $b = 10$ or $b = 2a$ and $c = 6a$ and $a = 5$	M1dep	oe $a + b + c = 1.5c$ is awarded M1M1 $a + b + c = 4.5b$ is awarded M1M1 $a + b + c = 9a$ is awarded M1M1	
	45	A1		
	Additional Guidance			
	30 ÷ 3 = 15, 15 ÷ 2 = 7.5, answer 52.5			M1M1A0
	15 ÷ 2 = 7.5, answer 52.5			M0M1A0
	30 ÷ 2 = 15, 30 + 15 = 45			M0M0A0
	Allow × 0.33 or better for ÷ 3			
	Do not accept 'of' for '×'			
	$30 \times \frac{3}{2} = 45$			M0M0A0
	$30 \times \frac{3}{2} = 45$ with evidence of $1.5c$			M1M1A1

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="6">13</td><td>Any right-angled triangle
with area 12 cm^2</td><td>B2</td><td>B1
for a non-right-angled triangle with area 12 cm^2
or
for any right-angled triangle with area $\neq$ 12 cm^2</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">For B2 or B1 the given side does not have to be used</td><td></td></tr>
<tr><td colspan="2">Mark intention</td><td></td></tr>
<tr><td colspan="2">Isosceles triangle with base 6 and height 3 gives a right-angled triangle
</td><td>B1</td></tr>
</table>

Q	Answer	Mark	Comments
14(a)	98 ÷ 7 or 14	M1	oe may be implied
	4 × their 14 or 56 or (7 + 4) × their 14 or 11 × their 14	M1dep	oe $\frac{4}{7} \times 98$ or $\frac{11}{7} \times 98$ score M1M1
	154	A1	SC1 171.5(0) SC1 269.5(0)
	Additional Guidance		
	SC1 is for using 4 hours Friday and 7 hours Saturday		

Q	Answer	Mark	Comments
14(b)	It is greater than the answer to part (a)	B1	

Q	Answer	Mark	Comments
15	True False False	B2	B1 two correct
	Additional Guidance		
	Accept any indication, but if a tick and a cross are used in the same row, mark the tick		
	A row with more than one tick is incorrect for that row		

Q	Answer	Mark	Comments
16(a)	Cannot be true Might be true Might be true	B3	B1 for each any clear indication
	Additional Guidance		
	Accept any indication, but if a tick and a cross are used in the same row, mark the tick		
	A row with more than one tick is incorrect for that row		

Q	Answer	Mark	Comments
16(b)	No and valid reason involving Farm B or No and valid reason involving the overlap of the intervals	B1	eg No and Farm B could have [635, 649] pigs eg No and the ranges overlap
	Additional Guidance		
	Ignore irrelevant statements		
	Any value for Farm B below 635 must also have an appropriate reference to Farm A		
	Stating incorrect values		B0
	Contradictory statements		B0
	No and Farm B is up to 650 / between 550 and 650 / 550 – 650		B0
	No and Farm B goes up to 649 pigs / could be between 550 and 649		B1
	No and they could both have 630 / the same		B1
	No and Farm B could have 630 and Farm A could have less (Farm B value below 635 and an appropriate reference to Farm A)		B1
	No and Farm A only goes up to 634 pigs and Farm B could have more than that		B1
	No and Farm B could have from 560 to 644 (560 is possible but irrelevant)		B1
	No and Farm B could have 640 pigs / could go up to 640 pigs		B1
	No and the ranges overlap so we cannot be certain		B1
	No and Farm A only goes up to 635 pigs and Farm B could have more than that		B0
	No and Farm A could be 635 and Farm B could be more (Farm A cannot be 635)		B0
	No and Farm B could have from 544 to 644		B0
	No and there could be 640 pigs (no mention of Farm B)		B0
	No and there may be more than 630 pigs in Farm B as it's rounded to the nearest 100 (Repeating the information given)		B0
	No and Farm A only goes up to 634 pigs (no mention of Farm B)		B0
	No and we do not know the exact amount as they have been rounded		B0

Q	Answer	Mark	Comments
17	**Alternative method 1: finds syrup needed for 6 milkshakes in litres**		
	$\frac{320 \times 6}{(1+3) \times 1000}$	M3	oe M2 any two correct steps eg $\frac{320}{(1+3) \times 1000}$ or 0.08 eg $\frac{320 \times 6}{1000}$ or 1.92 eg $\frac{320 \times 6}{(1+3)}$ or 480 M1 any one correct step eg 320×6 or 1920 eg $320 \div (1+3)$ or 80 eg $320 \div 1000$ or 0.32
	0.48 and Yes or 0.02 (litres) left	A1	

The mark scheme for question 17 continues on the next page

Q	Answer	Mark	Comments
17cont	**Alternative method 2: finds syrup needed for 6 milkshakes in ml**		
	$\frac{320 \times 6}{(1+3)}$ or 480	M2	oe M1 any one correct step eg 320 × 6 or 1920 eg 320 ÷ (1 + 3) or 80
	0.5 × 1000 or 500	M1	oe
	480 and 500 and Yes or 20 (ml) left	A1	
	Alternative method 3: compares total needed with total available in litres		
	$\frac{320 \times 6}{1000}$ or 1.92	M2	oe M1 any one correct step eg 320 × 6 or 1920 eg 320 ÷ 1000 or 0.32
	0.5 × (1 + 3) or 2	M1	oe
	1.92 and 2 and Yes	A1	
	Alternative method 4: compares total needed with total available in ml		
	0.5 × 1000 × (1 + 3) or 2000	M2	oe M1 any one correct step eg 0.5 × 1000 or 500 eg 1000 × (1 + 3) or 4000
	320 × 6 or 1920	M1	oe
	2000 and 1920 and Yes	A1	

The mark scheme for question 17 continues on the next page

17cont	**Alternative method 5: finds maximum syrup available per milkshake**		
	$\frac{0.5\times1000}{6}$ or 83(.3…)	M2	oe M1 any one correct step eg 0.5 × 1000 or 500
	320 ÷ (1 + 3) or 80	M1	oe
	83(.3…) and 80 and Yes	A1	
	Alternative method 6: finds maximum milkshake volume in ml or number of milkshakes		
	$\frac{0.5\times1000\times(1+3)}{6}$ or $\frac{0.5\times1000\times(1+3)}{320}$	M3	oe M2 any two correct steps eg $\frac{0.5\times1000}{6}$ or 83(.3…) eg 0.5 × 1000 × (1 + 3) or 2000 M1 any one correct step eg 0.5 × 1000 or 500
	333.(…) and Yes or 6.25 and Yes	A1	
	Alternative method 7: finds maximum milkshake volume in litres		
	$\frac{0.5\times(1+3)}{6}$ or 0.33(3…)	M2	oe M1 any one correct step eg (1 + 3) ÷ 6 or 0.66(6…) or 0.67
	320 ÷ 1000 or 0.32	M1	
	0.33(3…) and 0.32 and Yes	A1	
	Additional Guidance		
	Use the scheme that favours the student		
	Ignore units		

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="5">18</td><td>0.15 and 0.55 and 220 in correct positions</td><td>B3</td><td>oe eg $\frac{3}{20}$, $\frac{11}{20}$, 220
(accept a mix of fractions, decimals and percentages if correct equivalents)

B2
any two correct

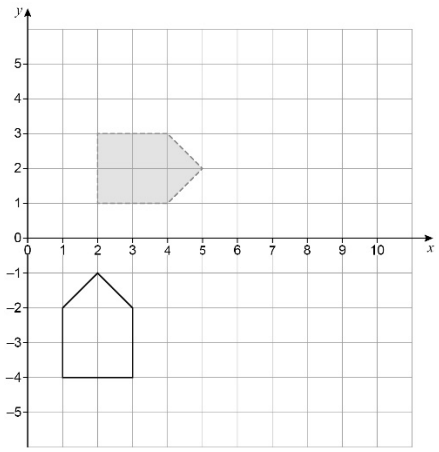
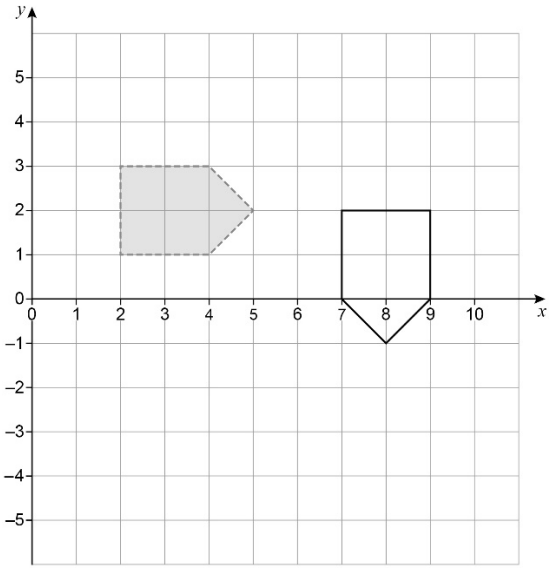
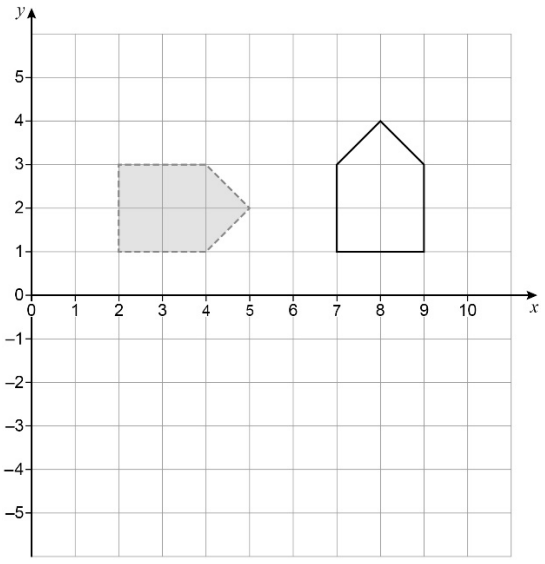
B1
any one correct
or
all three probabilities add up to 1</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2"><table><tr><th>Colour</th><th>Probability</th><th>Number of counters</th></tr><tr><td>Red</td><td>0.3</td><td>120</td></tr><tr><td>Blue</td><td>0.15</td><td>60</td></tr><tr><td>Green</td><td>0.55</td><td>220</td></tr></table></td><td>B3</td></tr>
<tr><td colspan="2"><table><tr><th>Colour</th><th>Probability</th><th>Number of counters</th></tr><tr><td>Red</td><td>0.3</td><td>120</td></tr><tr><td>Blue</td><td>0.4</td><td>60</td></tr><tr><td>Green</td><td>0.3</td><td>120</td></tr></table></td><td>B1</td></tr>
<tr><td colspan="2">Mark the table</td><td></td></tr>
</table>

Q	Answer	Mark	Comments
19	$2 \times (24 + 19)$ or 86	M1	oe implied by 60.2
	$16 + \frac{7}{10} \times$ their 86	M1	oe their 86 cannot be 16 or 19 or 24
	76.2(0)	A1	SC1 1436.2(0) SC1 46.1(0) SC1 335.2(0)
	Additional Guidance		
	SC1 1436.2(0) is from multiplying 86 by 16.7 46.1(0) is from using 24 + 19 335.2(0) is from using the area		
	Answer 76.20p		M1M1A1
	Answer 76.2p		M1M1A1

Q	Answer	Mark	Comments
20(a)	24 + 10 or 34 or –24 – 10 or –34 or 6 + 17 + 27 or 50 or –24 – 10 + 6 + 17 + 27 or 16 or 24 + 10 – 6 – 17 – 27 or –16 or –24 – 10 + 6 + 17 or – 11 or 24 + 10 – 6 – 17 or 11	M1	oe may be in thousands do not accept 16 or –16 if from incorrect work
	34 and 50 and (answer) 5 or –34 and 50 and (answer) 5 or 16 and (answer) 5 or –16 and (answer) 5 or – 11 and 27 and (answer) 5 or 11 and 27 and (answer) 5	A1	34, 50, –34, 16, –16, – 11, 11, 27 may be in thousands
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Condone eg 50K for 50 000		
	Condone an embedded correct calculation eg the inclusion of a value for year 6		

Q	Answer	Mark	Comments
20(b)	[39 000, 60 000]	B1	
	Additional Guidance		
	[39, 60]		B0
	Condone eg 50K for 50 000		
	Answer line blank with point plotted at Year 7 in range [39 000, 60 000]		B0

Q	Answer	Mark	Comments
21	Converts 35 km and 2 cm to the same unit or 1 750 000	M1	eg 3 500 000 or 0.02 and 35 000
	1 : 1 750 000	A1	
	Additional Guidance		
	Allow values written in standard form eg allow 1.75×10^6 for 1 750 000		
	Allow values in millions eg allow 3.5 million for 3 500 000		
	2 : 3 500 000	M1	
	1 : 3 500 000	M1	
	$1 : \frac{3\,500\,000}{2}$	M1A0	
	Ignore incorrect use of commas and/or spaces if digits are correct eg 1 : 17,500 00	M1A1	
	Ignore units		
	Ignore rounding after correct value has been seen		
	$1 : 1\,750\,000n$	M1A0	

Q	Answer	Mark	Comments
22		B2	B1 for all five vertices correctly plotted but not joined or for rotation 90° clockwise about the point (5, –1)  or any rotation of 90° anti-clockwise eg 
	Additional Guidance		
	$\pm\frac{1}{2}$ square tolerance for all vertices		
	Vertices must be joined with intended straight lines for B2		
	B1 answers must lie wholly on the grid		

Q	Answer	Mark	Comments
23(a)	$7n + 1$ or $1 + 7n$	B2	B1 correct unsimplified expression or $7n + k$ oe where k is any constant
	Additional Guidance		
	B2 response followed by further, incorrect work is B1 eg $7n + 1 = 8n$		B1
	B1 response followed by further, incorrect work is B1 eg $7n - 1 = 6n$		B1
	Ignore LHS eg1 $T_n = 7n + 1$ eg2 $n = 7n$		B2 B1
	Condone use of N or other variables		
	$7n$ may be seen as $7 \times n$ or $n \times 7$ or $n7$ for B1 but needs full simplification for B2 eg1 $7 \times n + 1$ eg2 $n7 + 1$ eg3 $n7$		B1 B1 B1
	Condone $8 + (n - 1)7$		B1

Q	Answer	Mark	Comments	
23(b)	**Alternative method 1: sets up an inequality or an equation**			
	$2n - 3 > 100$ or $2n - 3 = 100$ or $2n - 3 = 101$	M1	oe inequality or equation eg $2n > 103$ implied by 51.5 oe	
	52	A1	allow $n = 52$	
	Alternative method 2: trial and improvement			
	Correctly evaluates a term for $40 \leqslant n \leqslant 60$	M1	eg $n = 40$ and 77 or $2 \times 60 - 3$ and 117 ignore incorrect trials	
	52	A1	allow $n = 52$	
	Additional Guidance			
	Embedded answer $2 \times 52 - 3$			M1A0
	Answer 101 ($2 \times 52 - 3$ or $n = 52$ seen)			M1A0
	Answer 101 (neither $2 \times 52 - 3$ nor $n = 52$ seen)			M0A0
	Answer 52			M1A1

Q	Answer	Mark	Comments
24	$x = -2$ and $y = -3$	B1	

Q	Answer	Mark	Comments
25	A and D	B1	
	Additional Guidance		
	Check diagram for letters or triangles circled		

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="6">26</td><td>6, 8, 10 and 12
with no other values</td><td>B3</td><td>B2
6, 8, 10 and 12 with one other value
or
any three of 6, 8, 10 and 12 with no other value
or
6, 7, 8, 9, 10, 11 and 12

B1
$5 < x \leqslant 12$ oe eg $6 \leqslant x$ and $x \leqslant 12$
or
6, 8, 10 and 12 with two other values
or
any three of 6, 8, 10 and 12 with one other value
or
any two of 6, 8, 10 and 12 with no other value
or
6, 7, 8, 9, 10, and 11
or
5, 6, 7, 8, 9, 10, 11 and 12

SC2 6, 8, 10, 12 in the working and 4 on the answer line</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Ignore repeats for any mark</td><td></td></tr>
<tr><td colspan="2">Values may be in any order</td><td></td></tr>
<tr><td colspan="2">Mark the answer line. If the answer line scores B0 and SC2 not awarded look in the work for an inequality</td><td></td></tr>
<tr><td colspan="2">5, 6, 7, 8, 9, 10, 11</td><td>B0</td></tr>
</table>

Q	Answer	Mark	Comments
27	**Alternative method 1**		
	Three or four correct calculations or values for fx or 98	M1	where f is the frequency and x is the value correct calculations are 1×3 or 3 2×10 or 20 3×17 or 51 4×6 or 24
	$98 \div 36$ or sum of their four fx values $\div 36$	M1dep	oe eg $\frac{98}{36}$ or $\frac{49}{18}$
	$2.7(2\ldots)$ or $2\frac{26}{36}$ or $2\frac{13}{18}$	A1	oe decimal or mixed number
	Alternative method 2		
	Three or four correct calculations or values for fx or 98	M1	where f is the frequency and x is the value correct calculations are 1×3 or 3 2×10 or 20 3×17 or 51 4×6 or 24
	3×36 or 108	M1	oe
	98 and 108	A1	

The Additional Guidance for Question 27 is on the next page

	Additional Guidance	
27cont	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts	
	Alt 1 Accept any clear indication that mean is less than 3 eg $\frac{98}{36}$ and $3 \times 36 = 108$	M1M1A1
	Products seen but a different method used eg $36 \div 4$ is choice and scores a maximum of M1	
	Condone missing brackets eg $3 + 20 + 51 + 24 \div 36$	M2

Q	Answer	Mark	Comments
28	**Alternative method 1: Finds the overall total first**		
	$225 \times \frac{1}{3}$ or 75 or $975 \times \frac{3}{5}$ or 585	M1	oe
	$225 \times \frac{1}{3} + 975 \times \frac{3}{5}$ or $75 + 585$ or 660	M1dep	oe
	$\frac{\text{their } 75 + \text{their } 585}{225 + 975}$ or $\frac{660}{1200}$ or $\frac{11}{20}$ or 0.55	M1	oe numerator must be from the sum of two numbers 1 < their 75 < 225 1 < their 585 < 975
	55	A1	SC3 45 SC2 0.45 SC1 540

The mark scheme for question 28 continues on the next page

Q	Answer	Mark	Comments
28cont	**Alternative method 2: Finds the percentage for each year first**		
	$225 \times \frac{1}{3}$ or 75 or $975 \times \frac{3}{5}$ or 585	M1	oe
	$\frac{225 \times \frac{1}{3}}{225 + 975}$ or 0.0625 or 6.25 or $\frac{975 \times \frac{3}{5}}{225 + 975}$ or 0.4875 or 48.75	M1dep	oe
	their 0.0625 + their 0.4875 or 0.55	M1	oe their 0.0625 must be $<$ 0.1875 and cannot be from use of 0.3 for $\frac{1}{3}$ their 0.4875 must be $<$ 0.8125
	55	A1	SC3 45 SC2 0.45 SC1 540

The Additional Guidance for Question 28 is on the next page

	Additional Guidance	
28cont	Up to M3 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts	
	Allow 0.33 or better for $\frac{1}{3}$ and up to M3 can be scored if not recovered	
	Use of 0.3 for $\frac{1}{3}$ can be awarded up to a maximum of M2 in either Alt eg In Alt 2 $0.3 \times 225 = 67.5$ $0.6 \times 975 = 585$ M1 (for 0.6×975) $67.5 \div 1200 = 0.05625$ $585 \div 1200 = 0.4875$ M1dep (for $585 \div 1200$) $0.05625 + 0.4875$ M0 (because although it fits the inequalities, 0.05625 comes from use of 0.3)	
	The SCs are for calculating those that do not prefer Science and may be seen in the working	
	$\frac{100+560}{225+975}$ with no correct method for 100 and 560	M0M0 M1A0

Q	Answer	Mark	Comments
29	$\pi \times 15$ or [47, 47.13]	M1	oe eg [3.14, 3.142] × 15
	their [47, 47.13] ÷ 6 or 2.5π	M1dep	oe
	[7.8, 7.9]	A1	
	Additional Guidance		
	$\pi 15$		M1
	$\pi 2.5$		M2
	Ignore rounding to 8 after [7.8, 7.9] has been seen		
	Further incorrect work after [7.8, 7.9]		M2A0