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**GCSE  
MATHEMATICS  
8300/2F**

Foundation Tier Paper 2 Calculator

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**Mark scheme**

June 2024

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Version 1.0 Final



2 4 6 G 8 3 0 0 / 2 F / M S

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](https://www.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.

<b>M</b>	Method marks are awarded for a correct method which could lead to a correct answer.
<b>A</b>	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>B</b>	Marks awarded independent of method.
<b>ft</b>	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
<b>SC</b>	Special case. Marks awarded for a common misinterpretation which has some mathematical worth.
<b>M dep</b>	A method mark dependent on a previous method mark being awarded.
<b>B dep</b>	A mark that can only be awarded if a previous independent mark has been awarded.
<b>oe</b>	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
<b>[a, b]</b>	Accept values between a and b inclusive.
<b>[a, b)</b>	Accept values $a \leqslant \text{value} < b$
<b>3.14...</b>	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
<b>Use of brackets</b>	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.

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>1(a)</b>	$\frac{27}{100}$	B1	
	<b>Additional Guidance</b>		
	Ignore attempt to simplify after correct answer seen		

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>1(b)</b>	0.4	B1	oe decimal eg 0.40
	<b>Additional Guidance</b>		
	.4		B1

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>1(c)</b>	35	B1	

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>2(a)</b>	$5x$	B1	
	<b>Additional Guidance</b>		
	$5 \times x$ or $x \times 5$ or $x5$		B0

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>2(b)</b>	$10w$	B1	
	<b>Additional Guidance</b>		
	$10 \times w$ or $w \times 10$ or $w10$		B0

Q	Answer	Mark	Comments
2(c)	2	B1	
	<b>Additional Guidance</b>		
	$\frac{2}{1}$ or $2 \div 1$		B0

Q	Answer	Mark	Comments
2(d)	$y^3$	B1	
	<b>Additional Guidance</b>		
	$y^2 \times y$ or $y \times y^2$		B0

Q	Answer	Mark	Comments
3(a)	$c$	B1	

Q	Answer	Mark	Comments
3(b)	$a$ or $d$	B1	accept $a$ and $d$

Q	Answer	Mark	Comments
3(c)	0	B1	oe
	<b>Additional Guidance</b>		
	Accept none, zero, nought etc		

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>4(a)</b>	9.03	B1	
	<b>Additional Guidance</b>		
	9.03p		B1
	903p on the answer line		B1
	903 on the answer line with £ not crossed out		B0

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>4(b)</b>	2.56	B1	
	<b>Additional Guidance</b>		
	2.56p		B1
	256p on the answer line		B1
	256 on the answer line with £ not crossed out		B0

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>	
<b>5(a)</b>	5 × 20 or 100 or 2 × 20 or 40 or 5 – 2 or 3 or 5 × 4 or 20 <b>and</b> 2 × 4 or 8 <b>and</b> 20 – 8 or 12	M1	oe eg $20 + 20 + 20$ eg $20 + 20 + 20 + 20 + 20$ may be by the diagram	
	60		A1	
	<b>Additional Guidance</b>			
	Answer 60b BOD 60 bottles		M1A1	
	Further work eg $60 + 30 = 90$		M1A0	

Q	Answer	Mark	Comments
5(b)	<b>Alternative method 1</b>		
	$6\frac{1}{4} \times 20$ or 125	M1	oe eg $6 \times 20 + \frac{1}{4} \times 20$ or $120 + 5$ may be by the diagram
	their $125 \times 17.5(0)$	M1	oe
	2187.5(0)	A1	
	<b>Alternative method 2</b>		
	$6\frac{1}{4} \times 17.5(0)$ or 109.375 or 109.37 or 109.38	M1	oe eg $6 \times 17.5(0) + \frac{1}{4} \times 17.5(0)$ or $105 + 4.375$
	their $109.375 \times 20$	M1	oe
	2187.5(0)	A1	
	<b>Alternative method 3</b>		
	$20 \times 17.5(0)$ or 350	M1	oe
	their $350 \times 6\frac{1}{4}$	M1	oe eg their $350 \times 6 + \frac{1}{4} \times$ their 350 or $2100 + 87.5(0)$
	2187.5(0)	A1	
	<b>Additional Guidance</b>		
	2187.50p		M1M1A1
	Alt 1 $6 \times 20 = 120$ $120 \times 17.5(0)$		M0 M1A0
	Alt 2 $6 \times 17.5(0) = 105$ $105 \times 20$		M0 M1A0

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
6(a)	<i>DC or CD</i>	B1	
	<b>Additional Guidance</b>		
	CDE		B0
	C : D		B0

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>	
6(b)	Rectangle drawn with an area of 10	B2	any orientation B1 10 seen or any polygon drawn different from the given shape with an area of 10	
	<b>Additional Guidance</b>			
	B1 may be awarded for correct work with no shape or incorrect shape, even if this is seen amongst multiple shapes			
	Mark intention			
	10 may be seen on the diagram			
	Draws the given shape reflected or in a different orientation		B0	

Q	Answer	Mark	Comments
<b>Alternative method 1: one side measured</b>			
7.4 (cm) or 74 (mm) or 2.9 (inches)		B1	$\pm 2\text{ mm}$ allow [2.8, 3)
their $7.4 \times 3$ or their $74 \times 3$ or their $2.9 \times 3$ or [21.6, 22.8] or [216, 228] or [8.4, 9)		M1	oe their 7.4 must be [7, 8] their 74 must be [70, 80] their 2.9 must be [2.6, 3.2]
[21.6, 22.8] cm or [216, 228] mm or [8.4, 9) inches		A1ft	ft their 7.4 or their 2.9 with B0M1 awarded
<b>Alternative method 2: more than one side measured</b>			
Each side measured as 7.4 (cm) or 74 (mm) or 2.9 (inches)		B1	$\pm 2\text{ mm}$ allow [2.8, 3)
their $7.4 +$ their $7.4 +$ their $7.4$ or their $74 +$ their $74 +$ their $74$ or their $2.9 +$ their $2.9 +$ their $2.9$ or [21.6, 22.8] or [216, 228] or [8.4, 9)		M1	oe their 7.4 must be [7, 8] their 74 must be [70, 80] their 2.9 must be [2.6, 3.2]
[21.6, 22.8] cm or [216, 228] mm or [8.4, 9) inches		A1ft	ft their 7.4 or their 2.9 with B0M1 awarded

Additional guidance is on next page

<b>Additional Guidance</b>	
7 cont'd	In alternative method 2 the sides do not have to be equal eg 7.5, 7.5, 7.6 = 22.6 Cannot access the A mark as there are no units.
	eg sides measured as 7.6, 7.6, 7.7 $7.6 + 7.6 + 7.7$ = 22.9 cm Cannot gain the B mark as 7.7 is out of range
	eg 75, 80, 80 answer 235 mm 80 is out of range for the B mark but in range for the M mark. Method mark implied by correct answer for their values
	Further work after the correct answer seen eg 7.4 and $22.2 \div 2 = 11.1$ cm
	Ignore subsequent rounding once correct answer is seen
	Accept correct units seen with their answer in the working, even if missing from the answer line, provided they are not contradicted.
	Ignore any measurement of the height for the B mark

Q	Answer	Mark	Comments
8(a)	56 – 17 or 39	M1	
	13	A1	
	<b>Additional Guidance</b>		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen in multiple attempts		
	Ignore any values for blue or white cubes		
	eg		
	G B W R		
	17 13 13 13		
	With R unambiguously linked with 13		
	May be seen as a ratio		
	Unless contradicted on the answer line is awarded M1A1		
	17 (+) 13 (+) 13 (+) 13 without 13 linked to red	M1A0	
	13 and answer 13 out of 56	M1A1	
	13 and answer $\frac{13}{56}$	M1A0	
	13 and answer 56	M1A0	
	Answer $\frac{13}{56}$	M1A0	

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>8(b)</b>	56 + 24 or 80	M1	
	0.4 × their 80 or 32	M1dep	oe eg $0.4 \times 56 + 0.4 \times 24$ or $9.6 + 22.4$
	15	A1	
	<b>Additional Guidance</b>		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen in multiple attempts		
	15 and answer 15 out of 24		M1M1A1
	15 and answer $\frac{15}{24}$ or $\frac{3}{8}$		M1M1A0
	Answer $\frac{15}{24}$		M1M1A0
	80 seen embedded in a fraction		M1
	Answer $\frac{3}{8}$ with no other creditworthy work		M0M0A0
	Condone $80 \times 40\%$		M1M1
	40% of 80 is 2nd M0 unless recovered		
	Build up methods for finding 40% of 80 must be completed to be awarded the M mark  eg 80 followed by $10\% = 8$ and $4 \times 8 = 32$  eg $0.1 \times 80 = 6$ and $4 \times 6 = 24$  eg 80 followed by $10\% = 6$ and $4 \times 6 = 24$		M1M1 M1M1 M1M0

Q	Answer	Mark	Comments
9	<b>Alternative method 1</b>		
	270 ÷ 3 or 90 or 270 × 50 or 13500 or 270 × 0.5(0) or 135	M1	oe
	270 ÷ 3 × 50 or 270 ÷ 3 × 0.5(0)	M1dep	oe
	45	A1	
	<b>Alternative method 2</b>		
	Correctly finds units and cost for at least 30 miles	M1	eg 30 miles = 10 units and 10 units cost (£)5
	Correct method for cost of 270 miles	M1dep	
	45	A1	
	<b>Additional Guidance</b>		
	45.00(p)	M1M1A1	
	45.0	M1M1A0	
	Accept 0.33(...) or 33.(...)% for $\frac{1}{3}$		
	Further work eg $45 \div 2$	M1M1A0	
	Embedded answer of 45 but not selected	M1M1A0	

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
10(a)	2 × 8.5(0) or 17(0.00)	M1	oe
	38 – their 17 or 21	M1dep	
	their $21 \div 5$ or 4.2	M1dep	oe eg $5 \times 4.2(0)$
	4.20	A1	correct money notation SC2 5.90 SC1 5.9
<b>Additional Guidance</b>			
	Special case is for using 1 metre of linen at £8.5(0)		
	Allow 4.20(p) for the A mark		
	4.20 ÷ 5 = 84p		M1M1M1 A0

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
	$14 \times 0.65$ or $9.1(0)$ or $15 \times 0.65$ or $9.75$ or $10 \div 0.65$ or $15.3(\dots)$ or $15.4$ or $(5 - 7 \times 0.65) \times 2$ or $0.9(0)$	M1	oe allow in pence
	No and 15 with M1 awarded or No and (£)9.75	A1	oe eg No and she can get 1 more with M1 awarded
<b>10(b)</b>	<b>Additional Guidance</b>		
	Yes ticked		
	No may be implied if neither box ticked		
	$0.65 \times 14 = 9.1$ she can buy another No ticked	M1A1	
	$10 \div 0.65 = 15.38$ No ticked	M1A0	
	$0.65 \times 14 = 9.1$ she can buy more No ticked	M1A0	
	She can get 15 not 14 No ticked	M0A0	
	The left over change would make up another 65p so enough for another button No ticked	M0A0	

Q	Answer	Mark	Comments
11(a)	All 4 points plotted correctly with a straight line joining them	B2	$\pm \frac{1}{2}$ square B1 at least two correct points plotted mark intention for straight line
	<b>Additional Guidance</b>		
	Ignore additional or incorrect points for B2 or B1		
	Ignore any line or curve extended outside the range		
	The correct position of the line implies correctly plotted points		

Q	Answer	Mark	Comments
11(b)	<b>Alternative method 1: uses the graph</b>		
	Vertical line from $x = 2.5$ to their straight line	M1	$\pm \frac{1}{2}$ square implied by mark at correct point on graph or on vertical axis
	their 8.5	A1ft	$\pm \frac{1}{2}$ square ft their straight line graph if at least B1 awarded in (a)
	<b>Alternative method 2: substitutes into the equation</b>		
	3 $\times$ 2.5 + 1	M1	oe
	8.5	A1	
	<b>Alternative method 3: uses values from the table</b>		
	$\frac{7+10}{2}$	M1	oe eg $\frac{4+7+10+13}{4}$
	8.5	A1	
	<b>Additional Guidance</b>		
	Alternative method 1 – must have a line in part (a)		
	Alternative method 1 A vertical line from the $x$ -axis does not need to be drawn if the reading from the graph is correct within tolerance for their graph		

Q	Answer	Mark	Comments	
	3 5 6 7 9	B3	<p>B2 last digit square <b>and</b> middle digit even with three of the following constraints met:</p> <ul style="list-style-type: none"> <li>• only one square</li> <li>• only one even</li> <li>• no repeats</li> <li>• ascending order</li> </ul> <p>or 9 7 6 5 3</p> <p>B1 last digit square with no other squares</p> <p>or middle digit even with no other evens</p> <p>or 3 5 6 7 9 unordered, not scoring B2</p>	
<b>Additional Guidance</b>				
12	Mark the answer line			
	1 3 6 7 9 (two squares is only error)			B2
	3 5 6 7 1 (order is only error)			B2
	3 3 6 7 9 (repeat is only error)			B2
	0 3 6 7 9 (two even numbers)			B2
	3 3 2 3 9 (order wrong and repeats but middle digit is only even and/or last digit is only square)			B1
	3 3 2 3 4 (order wrong and two evens but last digit is only square)			B1
	1 3 4 5 7 (middle digit is only even)			B1
	2 2 5 6 4 (last digit is only square)			B1
	2 3 4 5 6			B0
	1 3 4 8 9			B0
	Must have 5 single digits			

Q	Answer	Mark	Comments
13	<b>Alternative method 1: find total</b>		
	4 × 10 or 40	M1	oe
	their 40 – 5 – 8 – 9	M1	oe their 40 must be greater than 22
	18	A1	
	<b>Alternative method 2: trial and improvement</b>		
	One trial evaluated correctly	M1	eg trials 12, $\frac{5+8+9+12}{4} = 8.5$
	The correct trial evaluated correctly	M1dep	
	18	A1	
<b>Additional Guidance</b>			
Embedded 18 without being selected as answer			M2A0

Q	Answer	Mark	Comments
14(a)	$d + 4$ or $4 + d$	B1	

Q	Answer	Mark	Comments
14(b)	3p or $3 \times p$ or $p \times 3$	B1	
			<b>Additional Guidance</b>
	Condone $p3$ as this question is testing inverse operations not expression notation		B1

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
15	$3n - 1$	B2	oe eg $2 + (3n - 3)$ B1 $3n + c$ where $c$ can be any value
	<b>Additional Guidance</b>		
	Ignore LHS of formula given eg $T_n = 3n - 1$		
	Condone $n = 3n - 1$ or $n$ th term = $3n - 1$		
	Allow a multiplication sign eg $3 \times n - 1$ or $n \times 3 - 1$		
	Allow other variables eg $3x - 1$		
	$3n + - 1$	B1	
	$3x$	B1	
	$n3 \dots$	B1	
	$n3 - 1$	B1	
	$3n$ th - 1	B1	
	$3n$ th	B0	
	$n3 - 1n$	B0	

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
16	segment	B1	region A
	sector	B1	region B

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
17	$\begin{pmatrix} 5 \\ 8 \end{pmatrix}$	B1	
	<b>Additional Guidance</b>		
	Condone 'fraction line' between the two numbers for B1 but must have the numbers in a column		
	If signs are in front of 5 and 8 they must be +		

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>18(a)</b>	$\frac{1}{4}$ (red) and $\frac{3}{4}$ (blue) for Bag A	B1	oe fractions, decimals or percentages
	$\frac{3}{5}$ (white) and $\frac{2}{5}$ (green) for both sections for Bag B	B1	oe fractions, decimals or percentages
	<b>Additional Guidance</b>		
Percentages must have the % symbol			

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>18(b)</b>	$\frac{1}{4} \times \frac{3}{5}$	M1	oe fractions, decimals or percentages correct or ft their tree diagram with both probabilities $> 0$ and $< 1$
	$\frac{3}{20}$ or 0.15 or 15%	A1ft	correct or ft their tree diagram with both probabilities $> 0$ and $< 1$
	<b>Additional Guidance</b>		
Further work after correct answer seen		M1A0	

Q	Answer	Mark	Comments
19	<b>Alternative method 1</b>		
	sin chosen or used	M1	
	31 × sin 24	M1dep	accept $31 \times [0.4, 0.41]$
	[12.6, 12.61]	A1	accept 13 if M2 awarded
	<b>Alternative method 2</b>		
	cos (90 – 24)	M1	
	31 × cos (90 – 24)	M1dep	accept $31 \times [0.4, 0.41]$
	[12.6, 12.61]	A1	accept 13 if M2 awarded
	<b>Additional Guidance</b>		
	Check diagram for working		
	Allow correct use of sine rule to indicate sin 24		
	Ignore rounding or truncating after the correct answer is seen		
	sin 24 × 31		M2
	Do not accept answers from full sized or scale drawing		
	sin may be indicated by eg circling S in SOH CAH TOA		

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
20	88(%) or 0.88	M1	oe eg 1 – 0.12
	$2200000 \div 88 (\times 100)$ or $25000 (\times 100)$	M1dep	oe eg $2.2 \times 10^6 \div (100 - 12) (\times 100)$ or $2200000 \times [1.136, 1.14]$ or 2500000
	$2.5 \times 10^6$	A1	oe standard form eg $2.500000 \times 10^6$ SC1 $2.2 \times 10^6$ oe standard form seen SC1 any value seen converted to standard form
<b>Additional Guidance</b>			
M1 or SC1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts			
M1 may be seen in a trial or incorrect working eg $3000000 \times 0.88$ or 88% of 2200000			M1
$2200000 \div 88\%$ not recovered			M1M0
$2200000 \times 1.12 = 2464000$ $2.464 \times 10^6 = 2.5 \times 10^6$			SC1

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>21(a)</b>	The number of blueberries in the tub	B1	

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>						
<b>21(b)</b>	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>2</td><td>6</td><td>8</td></tr> <tr> <td>120</td><td>40</td><td>30</td></tr> </table>	2	6	8	120	40	30	B2	B1 40 or 8 in the correct position or $(k =) 120 \times 2$ or $(k =) 240$ seen
2	6	8							
120	40	30							
<b>Additional Guidance</b>									
$(k =) 240$ or $(k =) 120 \times 2$ may be seen anywhere on the page									
240 may be seen embedded in the formula eg $120 = \frac{240}{2}$		B1							

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
	The same number of 7s as even numbers	M1	any order may be in a list or on the spinner must be at least one 7
	5, 5, 6, 7, 7, 8	A1	any order may be in a list or on the spinner may be implied
	$\frac{2}{6}$	A1ft	oe fraction, decimal or percentage ft M1A0 with completed spinner or list of six numbers
<b>Additional Guidance</b>			
<b>22(a)</b>	Ignore simplification or conversion attempt after correct answer seen		
	Accept 0.33(...) or 33.(...)% for $\frac{2}{6}$		
	A list/spinner with blanks and/or using other numbers may still score M1 eg 5, 5, 7, 10 or 5, 6, 7, 7, 8, 9		M1
	$\frac{2}{6}$ with no incorrect working eg 5, 6, 7, 8 on spinner with 2 blanks answer $\frac{2}{6}$ (M1A1 is implied)		M1A1A1
	5, 5, 6, 6, 7, 7 with answer $\frac{2}{6}$		M1A0A1ft
	5, 5, 5, 5, 6, 7 with answer $\frac{4}{6}$		M1A0A1ft
	5, 6, 6, 7, 7, 9 with answer $\frac{2}{6}$		M1A0A0ft
	5, 5, 5, 5, 5, 6 with answer $\frac{5}{6}$		MOA0A0ft

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>22(b)</b>	Valid reason	B1	eg sum of probabilities is not 1
	<b>Additional Guidance</b>		
	Ignore irrelevant statements alongside a correct statement eg the sum of the probabilities is not 1 and the probabilities are not percentages		B1
	Do not ignore incorrect statements alongside a correct statement eg the sum of the probabilities is 0.11 not 1		B0
	They add up to 1.1		B1
	They add up to 110%		B1
	It is 0.1 too much		B1
	One of the probabilities is 0.1 too much		B1
	It should be something like 0.1, 0.2, 0.3, 0.4		B1
	B should be 0.4		B1
	They don't add up correctly		B0
	They add up to 0.11		B0
	It's not a fair spinner		B0

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>23(a)</b>	$C (0, 6)$	B1	if answer space is blank, accept $(0, 6)$ written at $C$ on the diagram
	$D (3, 0)$	B1	if answer space is blank, accept $(3, 0)$ written at $D$ on the diagram
<b>Additional Guidance</b>			
For each part mark the answer space unless blank			
Allow $x$ and $y$ written above the coordinates but do not allow eg $(0x, 6y)$			

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>23(b)</b>	5	B1	
	3	B1	
<b>Additional Guidance</b>			
Mark the answer lines only			
Do not allow eg $(0, 5)$			

Q	Answer	Mark	Comments
24	$\frac{52}{200}$ or $\frac{26}{100}$ or $\frac{13}{50}$	B1	oe fraction, decimal or percentage eg 0.26 or 26%
	Valid reason involving the number of trials	B1	eg it is from using the largest number of flips
	<b>Additional Guidance</b>		
	1st B1 Ignore simplification or conversion attempt after correct answer seen eg $\frac{52}{200} = 0.28$		1st B1
	52 out of 200 or 52 : 200		1st B0
	Probability from incorrect working eg $\frac{10 + 30 + 40 + 50}{50 + 100 + 150 + 200} = \frac{130}{500}$		1st B0
	Ignore irrelevant statements alongside a correct statement eg Using most flips and they could have done more		2nd B1
	Do not ignore incorrect statements alongside a correct statement eg Uses all the flips but they could have used 100 flips		2nd B0
	It uses all the flips		2nd B1
	More spins		2nd B1
	200 is the largest amount of data		2nd B1
	200 is the highest number		2nd B1
	200 is the total number of flips		2nd B0
	200 flips gives 52 heads		2nd B0
	200 is the final result		2nd B0
	That is the highest number in the table		2nd B0
	The highest results are more accurate		2nd B0
	100 flips is easier to work out		2nd B0
	He could use any of the results		2nd B0
	B0B1 is possible eg Answer 27% Reason Use the one from most spins		B0B1

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
	A change in distance for an integer time interval or a change in distance for a non-integer time interval with the corresponding time interval	M1	integer time intervals are [88, 92] [70, 74] [52, 56] [34, 38] [16, 20] may be seen on graph
	$\frac{\text{their change in distance}}{\text{corresponding time interval}}$	M1dep	oe eg $\frac{[88, 92]}{5}$ must see their change in distance and the corresponding time interval division by 1 may be implied
25	18	A1	SC1 24
<b>Additional Guidance</b>			
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	$90 \times 5$		M1M0
	(1 second) Answer [16, 20] is awarded at least M2		
	18 from incorrect working cannot score A1		
	18 followed by further work eg $18 \div 5 = 3.6$		M1M0