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**GCSE**  
**MATHEMATICS**  
**8300/2F**

Paper 2 Calculator

Foundation tier

Shadow paper based on June 2024 question paper

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Mark scheme

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Version: 1.0

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.

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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. e.g. 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 $a \leq \text{value} < b$
<b>3.14...</b>	Accept answers which begin 3.14 e.g. 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.

Q	Answer	Mark	Comments
1(a)	$\frac{41}{100}$	B1	
	<b>Additional Guidance</b>		
	Ignore attempt to simplify after correct answer seen		

Q	Answer	Mark	Comments
1(b)	0.75	B1	
	<b>Additional Guidance</b>		
	.75		B1

Q	Answer	Mark	Comments
1(c)	78	B1	

Q	Answer	Mark	Comments
2(a)	$7x$	B1	
	<b>Additional Guidance</b>		
	$7 \times x$ or $x \times 7$ or $x7$		B0

Q	Answer	Mark	Comments
2(b)	$20p$	B1	
	<b>Additional Guidance</b>		
	$20 \times p$ or $p \times 20$ or $p20$ or $20^p$		B0

Q	Answer	Mark	Comments
2(c)	10	B1	
	<b>Additional Guidance</b>		
	$\frac{10}{1}$ or $10 \div 1$		B0

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

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

Q	Answer	Mark	Comments
3(b)	$b$	B1	

Q	Answer	Mark	Comments
3(c)	1	B1	oe

Q	Answer	Mark	Comments
4(a)	10.71	B1	
	<b>Additional Guidance</b>		
	10.71p		B1
	1071p on the answer line		B1
	1071 on the answer line with £ not crossed out		B0

Q	Answer	Mark	Comments
4(b)	2.67	B1	
	<b>Additional Guidance</b>		
	2.67p		B1
	267p on the answer line		B1
	267 on the answer line with £ not crossed out		B0

Q	Answer	Mark	Comments
5(a)	6 × 24 or 144 or 4 × 24 or 96 or 6 – 4 or 2 or 6 × 4 or 24 <b>and</b> 4 × 4 or 16 <b>and</b> 24 – 16 or 8	M1	oe e.g. 24 + 24 + 24 + 24 + 24 + 24 e.g. 24 + 24 may be by the diagram
	48	A1	
	<b>Additional Guidance</b>		
	Answer 48p BOD 48 pizzas		M1A1
	Further work e.g. 48 + 38 = 86		M1A0

Q	Answer	Mark	Comments
5(b)	<b>Alternative method 1</b>		
	$5\frac{1}{4} \times 24$ or 126	M1	oe e.g. $5 \times 24 + \frac{1}{4} \times 24$ or $120 + 6$ may be by the diagram
	their $126 \times 13.75$	M1	oe
	1732.5(0)	A1	
	<b>Alternative method 2</b>		
	$5\frac{1}{4} \times 13.75$ or 72.1875 or 72.18 or 72.19	M1	oe e.g. $5 \times 13.75 + \frac{1}{4} \times 13.75$ or $68.75 + 3.4375$
	their $72.1875 \times 24$	M1	oe
	1732.5(0)	A1	
	<b>Alternative method 3</b>		
	$24 \times 13.75$ or 330	M1	oe
	their $330 \times 5\frac{1}{4}$	M1	oe e.g. their $330 \times 5 + \frac{1}{4} \times$ their 330 or $1650 + 82.5(0)$
	1732.5(0)	A1	
	<b>Additional Guidance</b>		
	1732.50p	M1M1A1	
	Alt 1 $5 \times 24 = 120$ $120 \times 13.75$	M0 M1A0	
Alt 2 $5 \times 13.75 = 68.75$ $68.75 \times 24$	M0 M1A0		

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

Q	Answer	Mark	Comments
6(b)	Rectangle drawn with an area of 12	B2	any orientation B1 12 seen or any polygon drawn different from the given shape with an area of 12
	<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		
	12 may be seen on the diagram		
	Draws the given shape reflected or in a different orientation		B0

Q	Answer	Mark	Comments
7	<b>Alternative method 1: one side measured</b>		
	8.7 (cm) or 87 (mm) or 3.4 (inches)	B1	± 2 mm  allow [3.3, 3.5)
	their $8.7 \times 3$ or their $87 \times 3$ or their $3.4 \times 3$ or [25.5, 26.7] or [255, 267] or [9.9, 10.5)	M1	oe their 8.7 must be [8, 9.5] their 87 must be [80, 95] their 3.4 must be [3.1, 3.7]
	[25.5, 26.7] cm or [255, 267] mm or [9.9, 10.5) inches	A1ft	ft their 8.7 or their 3.4 with B0M1 awarded Must have correct units for this mark
	<b>Alternative method 2: more than one side measured</b>		
	Each side measured as 8.7 (cm) or 87 (mm) or 3.4 (inches)	B1	± 2 mm  allow [3.3, 3.5)
	their $8.7 +$ their $8.7 +$ their $8.7$ or their $87 +$ their $87 +$ their $87$ or their $3.4 +$ their $3.4 +$ their $3.4$ or [25.5, 26.7] or [255, 267] or [9.9, 10.5)	M1	oe their 8.7 must be [8, 9.5] their 87 must be [80, 95] their 3.4 must be [3.1, 3.7]
	[25.5, 26.7] cm or [255, 267] mm or [9.9, 10.5) inches	A1ft	ft their 8.7 or their 3.4 with B0M1 awarded

Additional guidance is on next page

<b>Additional Guidance</b>		
<b>7 cont'd</b>	<p>In alternative method 2 the sides do not have to be equal</p> <p>e.g.</p> <p>8.8, 8.8, 8.9</p> <p>= 26.5</p> <p>Cannot access the A mark as there are no units.</p>	<p>B1</p> <p>M1A0ft</p>
	<p>e.g.</p> <p>sides measured as 8.9, 8.9, 9</p> <p>8.9 + 8.9 + 9</p> <p>= 26.8 cm</p> <p>Cannot gain the B mark as 9 is out of range</p>	<p>B0</p> <p>M1</p> <p>A1ft</p>
	<p>e.g.</p> <p>88, 90, 90</p> <p>answer 268 mm</p> <p>90 is out of range for the B mark but in range for the M mark. Method mark implied by correct answer for their values</p>	<p>B0</p> <p>M1A1ft</p>
	<p>Further work after the correct answer seen e.g. <math>8.7</math> and <math>26.1 \div 2 = 13.05</math> cm</p>	<p>B1M1A0</p>
	<p>Ignore subsequent rounding once correct answer is seen</p>	
	<p>Accept correct units seen with their answer in the working, even if missing from the answer line, provided they are not contradicted.</p>	
	<p>Ignore any measurement of the height for the B mark</p>	

Q	Answer	Mark	Comments	
<b>8(a)</b>	60 – 18 or 42	M1		
	14	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 orange or black cubes			
	e.g. Y P O B 18 14 14 14 With P unambiguously linked with 14 May be seen as a ratio Unless contradicted on the answer line is awarded M1A1			
	18 (+) 14 (+) 14 (+) 14 without 14 linked to purple			M1A0
	14 and answer 14 out of 60			M1A1
	14 and answer $\frac{14}{60}$			M1A0
	14 and answer 60			M1A0
	Answer $\frac{14}{60}$			M1A0

Q	Answer	Mark	Comments	
<b>8(b)</b>	60 + 25 or 85	M1		
	0.6 × their 85 or 51	M1dep	oe e.g. 0.6 × 60 + 0.6 × 25 or 36 + 15	
	33	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			
	33 and answer 33 out of 85			M1M1A1
	33 and answer $\frac{33}{85}$			M1M1A0
	Answer $\frac{33}{85}$			M1M1A0
	85 seen embedded in a fraction			M1
	Condone 85 × 60%			M1M1
	60% of 85 is 2nd M0 unless recovered			
	Build up methods for finding 60% of 85 must be completed to be awarded the M mark e.g. 85 followed by 10% = 8.5 and 6 × 8.5 = 51 e.g. 0.1 × 85 = 8 and 8 × 6 = 48 e.g. 85 followed by 10% = 8 and 8 × 6 = 48			M1M1 M1M1 M1M0

Q	Answer	Mark	Comments
9	<b>Alternative method 1</b>		
	320 ÷ 4 or 80 or 320 × 60 or 19200 or 320 × 0.6(0) or 192	M1	oe
	320 ÷ 4 × 60 or 320 ÷ 4 × 0.6(0)	M1dep	oe
	48	A1	
	<b>Alternative method 2</b>		
	Correctly finds units and cost for at least 40 miles	M1	e.g. 40 miles = 10 units and 10 units cost (£)6
	Correct method for cost of 320 miles	M1dep	
	48	A1	
	<b>Additional Guidance</b>		
	48.00(p)		M1M1A1
	48.0		M1M1A0
	Further work e.g. 48 ÷ 2		M1M1A0
	Embedded answer of 48 but not selected		M1M1A0

Q	Answer	Mark	Comments	
10(a)	$2 \times 17.5(0)$ or $35(.00)$	M1	oe	
	$58 - \text{their } 35$ or $23$	M1dep		
	their $23 \div 5$ or $4.6$	M1dep	oe e.g. $5 \times 4.6(0)$	
	4.60	A1	correct money notation SC2 8.10 SC1 8.1	
	<b>Additional Guidance</b>			
	Special case is for using 1 metre of linen at $\pounds 17.5(0)$			
	Allow $4.60(p)$ for the A mark			
	$4.60 \div 5 = 92p$			M1M1M1 A0

Q	Answer	Mark	Comments
10(b)	$12 \times 4.5(0)$ or 54 or $13 \times 4.5(0)$ or 58.5(0) or $60 \div 4.5(0)$ or 13.3(...) or $(30 - 6 \times 4.5(0)) \times 2$ or 6	M1	oe allow in pence
	No and 13 with M1 awarded or No and (£)58.5(0)	A1	oe e.g. No and she can get 1 more with M1 awarded
	<b>Additional Guidance</b>		
	Yes ticked		max M1A0
	No may be implied if neither box ticked		
	$4.5(0) \times 12 = 54$ she can buy another No ticked		M1A1
	$60 \div 4.5(0) = 13.3(\dots)$ No ticked		M1A0
	$4.5(0) \times 12 = 54$ she can buy more No ticked		M1A0
	She can get 13 not 12 No ticked		M0A0
The left-over change would make up another 4.5(0) so enough for another ticket 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 $x = 3.5$ to their straight line	M1	$\pm \frac{1}{2}$ square implied by mark at correct point on graph or on vertical axis
	their 9.5	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>		
	$3 \times 3.5 - 1$	M1	oe
	9.5	A1	
	<b>Alternative method 3: uses values from the table</b>		
	$\frac{8+11}{2}$	M1	oe
	9.5	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
12	2 3 4 6 8	B3	B2 last digit cube <b>and</b> second digit odd with three of the following constraints met: <ul style="list-style-type: none"> <li>• only one cube</li> <li>• only one odd</li> <li>• no repeats</li> <li>• ascending order</li> </ul> or 8 6 4 3 2 B1 last digit cube with no other cubes or second digit odd with no other odds or 2 3 4 6 8 unordered, not scoring B2
	<b>Additional Guidance</b>		
	Mark the answer line		
	2 3 6 4 8 (order is only error)	B2	
	2 3 4 4 8 (repeat is only error)	B2	
	2 3 5 6 8 (two odd numbers)	B2	
	2 5 6 4 8 (order wrong and repeats but second digit is only odd and/or last digit is only cube)	B1	
	1 2 4 3 8 (order wrong and two odds but last digit is only cube)	B1	
	2 3 4 8 6 (second digit is only odd)	B1	
	Must have 5 single digits to score B1, B2 or B3		

Q	Answer	Mark	Comments
13	<b>Alternative method 1: find total</b>		
	$4 \times 8$ or 32	M1	oe
	their $32 - 6 - 7 - 10$	M1	oe their 32 must be greater than 23
	9	A1	
	<b>Alternative method 2: trial and improvement</b>		
	One trial evaluated correctly	M1	e.g. trials 12, $\frac{6+7+10+12}{4} = 8.75$
	The correct trial evaluated correctly	M1dep	
	9	A1	
	<b>Additional Guidance</b>		
	Embedded 9 without being selected as answer		M2A0

Q	Answer	Mark	Comments
14(a)	$k - 5$ or $-5 + k$	B1	

Q	Answer	Mark	Comments
14(b)	$4p$ or $4 \times p$ or $p \times 4$	B1	
	<b>Additional Guidance</b>		
	Condone $p4$ as this question is testing inverse operations not expression notation		B1

Q	Answer	Mark	Comments
15	$5n - 2$ or $-2 + 5n$	B2	oe e.g. $3 + (5n - 5)$ B1 $5n + c$ where $c$ can be any value
	<b>Additional Guidance</b>		
	Ignore LHS of formula given e.g. $T_n = 5n - 2$		B2
	Condone $n = 5n - 2$ or $n$ th term = $5n - 2$		B2
	Allow a multiplication sign e.g. $5 \times n - 2$ or $n \times 5 - 2$		B2
	Allow other variables e.g. $5x - 2$		B2
	$5n + - 2$		B1
	$5x$		B1
	$n5 \dots$		B1
	$n5 - 2$		B1
	$5n$ th $- 2$		B1
	$5n$ th		B0
	$n5 - 2n$		B0

Q	Answer	Mark	Comments
16	diameter	B1	line A
	chord	B1	line B

Q	Answer	Mark	Comments
17	$\begin{pmatrix} 8 \\ 6 \end{pmatrix}$	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 8 and 6, they must be +		

Q	Answer	Mark	Comments
18(a)	$\frac{1}{5}$ (contains nuts) and $\frac{4}{5}$ (plain) for Box A	B1	oe fractions, decimals or percentages
	$\frac{7}{10}$ (white) and $\frac{3}{10}$ (milk) for both sections for Box B	B1	oe fractions, decimals or percentages
	<b>Additional Guidance</b>		
	Percentages must have the % symbol		

Q	Answer	Mark	Comments
18(b)	$\frac{1}{5} \times \frac{7}{10}$	M1	oe fractions, decimals or percentages correct or ft their tree diagram with both probabilities $> 0$ and $< 1$
	$\frac{7}{50}$ or 0.14 or 14%	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
<b>19</b>	<b>Alternative method 1</b>		
	cos chosen or used	M1	
	15 ÷ cos 36	M1dep	oe accept 15 ÷ [0.8, 0.81]
	[18.5, 18.542]	A1	accept 19 if M2 awarded
	<b>Alternative method 2</b>		
	sin (90 – 36)	M1	
	15 ÷ sin (90 – 36)	M1dep	oe accept 15 ÷ [0.8, 0.81]
	[18.5, 18.542]	A1	accept 19 if M2 awarded
	<b>Additional Guidance</b>		
	Check diagram for working		
	Allow correct use of cosine rule to indicate cos 36		
	Ignore rounding or truncating after the correct answer is seen		
	15 ÷ cos 36		M2
	Do not accept answers from full sized or scale drawing		
cos may be indicated by e.g. circling C in SOH CAH TOA			

Q	Answer	Mark	Comments
20	72(%) or 0.72	M1	oe e.g. 1 – 0.28
	2088 000 ÷ 72 (× 100) or 29 000 (× 100)	M1dep	oe e.g. $2.088 \times 10^6 \div (100 - 28) (\times 100)$ or $2088\,000 \times [1.38, 1.39]$ or 2088 000
	$2.9 \times 10^6$	A1	oe standard form e.g. $2.900\,000 \times 10^6$ SC1 $2.088 \times 10^6$ 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 e.g. $2\,000\,000 \times 0.72$ or 72% of 2088 000		M1
	2088 000 ÷ 72% not recovered		M1M0
	$2088\,000 \times 1.28 = 2\,672\,640$ $= 2.67264 \times 10^6$		SC1

Q	Answer	Mark	Comments
21(a)	The number of seeds in the bags	B1	

Q	Answer	Mark	Comments						
21(b)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">30</td> <td style="padding: 5px;">120</td> <td style="padding: 5px;">300</td> </tr> <tr> <td style="padding: 5px;">20</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">2</td> </tr> </table>	30	120	300	20	5	2	B2	B1 5 or 300 in the correct position or $(k =) 30 \times 20$ or $(k =) 600$ seen
	30	120	300						
	20	5	2						
	<b>Additional Guidance</b>								
$(k =) 600$ or $(k =) 30 \times 20$ may be seen anywhere on the page									
600 may be seen embedded in the formula e.g. $20 = \frac{600}{30}$		B1							

Q	Answer	Mark	Comments	
<b>22(a)</b>	The same number of 1s as even numbers	M1	any order may be in a list or on the spinner must be at least one 1	
	e.g. 1, 1, 2, 3, 3, 3, 3, 4	A1	any order may be in a list or on the spinner may be implied	
	$\frac{4}{8}$	A1ft	oe fraction, decimal or percentage ft M1A0 with completed spinner or list of six numbers	
	<b>Additional Guidance</b>			
	Ignore simplification or conversion attempt after correct answer seen			
	A list/spinner with blanks and/or using other numbers may still score M1 e.g. 1, 3, 3, 10 or 1, 1, 2, 2, 3, 3, 3, 3			M1
	$\frac{4}{8}$ oe with no incorrect working e.g. 1, 2, 3, 4 on spinner with 4 blanks answer $\frac{4}{8}$ (M1A1 is implied)			M1A1A1
	1, 1, 2, 2 with answer $\frac{4}{8}$			M1A0A1ft
	1, 2, 3, 3, 3, 3, 3, 3 with answer $\frac{6}{8}$			M1A0A1ft
	1, 1, 1, 2, 2, 2, 3, 3 with answer $\frac{4}{8}$			M1A0A0ft
3, 3, 3, 3, 3, 3, 3, 4 with answer $\frac{7}{8}$			M0A0A0ft	

Q	Answer	Mark	Comments
<b>22(b)</b>	Valid reason	B1	e.g. sum of probabilities is not 1
	<b>Additional Guidance</b>		
	Ignore irrelevant statements alongside a correct statement e.g. the sum of the probabilities is not 1 and the probabilities are not percentages	B1	
	Do not ignore incorrect statements alongside a correct statement e.g. the sum of the probabilities is 0.115 not 1	B0	
	They add up to 1.15	B1	
	They add up to 115%	B1	
	It is 0.15 too much	B1	
	One of the probabilities is 0.15 too much	B1	
	It should be something like 0.3, 0.1, 0.4, 0.2	B1	
	They don't add up correctly	B0	
	They add up to 0.115	B0	
	It's not a fair spinner	B0	

Q	Answer	Mark	Comments
23(a)	$C(0, 12)$	B1	if answer space is blank, accept $(0, 12)$ written at $C$ on the diagram
	$D(4, 0)$	B1	if answer space is blank, accept $(4, 0)$ 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 e.g. $(0x, 12y)$		

Q	Answer	Mark	Comments
23(b)	20	B1	
	- 6	B1	
	<b>Additional Guidance</b>		
	Mark the answer lines only		
	Do not allow e.g. $(0, 20)$		

Q	Answer	Mark	Comments
24	$\frac{3591}{10000}$	B1	oe fraction, decimal or percentage e.g. 0.35(9...) or 0.36 or 35.9(...) % or 36%
	Valid reason involving the number of trials	B1	e.g. it is from using the largest number of flips
	<b>Additional Guidance</b>		
	1st B1 Ignore simplification or conversion attempt after correct answer seen e.g. $\frac{3591}{10000} = 40\%$		1st B1
	3591 out of 10000 or 3591 : 10000		1st B0
	Probability from incorrect working e.g. $\frac{3 + 37 + 389 + 3591}{10 + 100 + 1000 + 10000} = \frac{4020}{10000}$		1st B0
	Ignore irrelevant statements alongside a correct statement e.g. Using most flips and they could have done more		2nd B1
	Do not ignore incorrect statements alongside a correct statement e.g. Uses all the flips but they could have used 1000 flips		2nd B0
	It uses all the flips		2nd B1
	More spins		2nd B1
	10000 is the largest amount of data		2nd B1
	10000 is the highest number		2nd B1
	10000 is the total number of flips		2nd B0
	10000 flips give 3591 heads		2nd B0
	10000 is the final result		2nd B0
	That is the highest number in the table		2nd B0
	The highest results are more accurate		2nd B0
	1000 flips is easier to work out		2nd B0
	He could use any of the results		2nd B0
	B0B1 is possible e.g. Answer 42% Reason Use the one from most spins		B0B1

Q	Answer	Mark	Comments
25	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 [108, 112] [86, 90] [64, 68] [42, 46] [20, 24] may be seen on graph
	$\frac{\text{their change in distance}}{\text{corresponding time interval}}$	M1dep	oe must see their change in distance and the corresponding time interval division by 1 may be implied
	18	A1	
	<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		
	110 × 5		M1M0
	(1 second) Answer [20, 24] is awarded at least M2		
	22 from incorrect working cannot score A1		
22 followed by further work e.g. $22 \div 5 = 4.4$		M1M0	