

# REVISE

.wales

## F2.18 – Probability vocabulary, scale & single events

*Mark schemes for the F2.18 question pack*

*Spec 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6 – Unit 2*

SOLUTIONS · 2025 SPECIFICATION

*Mark schemes for the 90 questions in the corresponding revise.wales question pack (189 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.*

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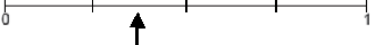
4. (a)	obtuse		B1	
4 (b)	cuboid		B1	

3.(c)	Correct translation.		B1	
4.(a)		$1/6$	B1	
4.(b)		10	B1	
4.(c)	6 blue 6 yellow 3 pink		B1	

<p>6(a) ( David – Hr    Jane – Rh    Mary – P )</p> <p>David – Hr    Jane – P    Mary – Rh          David – Rh    Jane – Hr    Mary – P          David – Rh    Jane – P    Mary – Hr          David – P    Jane – Hr    Mary – Rh          David – P    Jane – Rh    Mary – Hr</p>		B2	<p>SC1 for reversed answer A = 3 and B = 12.          Allow any unambiguous notation e.g. 'DH'.          For all other 5 different combinations.          Do not penalise repeats.          B1 for 3 or 4 other <u>different</u> combinations.          B0 otherwise.</p>
<p>6.(b)            <math>\frac{4}{6}</math> or equivalent.    ISW</p>		B2	<p><math>\frac{2}{3}</math> or <math>\frac{4}{6}</math> gains B2 regardless of their list.          B1 for <math>x/6</math> (<math>x &lt; 6</math>) OR <math>\frac{4}{y}</math> (<math>y &gt; 4</math>)          F.T. 'their list' (using <u>different</u> combinations) if at least 4 to choose from for B2 or B1 as appropriate.</p>

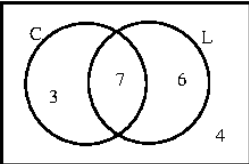
	OR 10, 11 and 18.		
6.(a)	-3, -1 and 1	B2	B1 for any two correct in the correct positions OR B1 for -5, -3 and -1 OR B1 for -1, 1 and 3.
6.(b)	$4n + 3$	B2	B1 for sight of $4n$ or $n4$ (but not $4n^k$ $k \neq 1$ ). Mark final answer

8.(b) (iii)	5-4	B1	
<p>9.</p> <p>(Use of area of PBCQ =) <math>52 - 20 (= 32 \text{ cm}^2)</math>                      (Area of PBCQ =) <math>8 \times f = 32</math></p> <p style="text-align: right;"><math>f = 4</math></p> <p>(Area of APQD =) <math>4 \times g = 20</math>  <math>g = 5</math></p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>OC1</p> <p>W1</p>	<p><i>Answers /working may be seen on diagram.</i></p> <p>F.T. 'their derived 32' but not 52                      [B1M1 implied by <math>8f = 32</math>]                      C.A.O. (implies B1M1A1)</p> <p><u>Alternative method</u>  <math>f \times (g + 8) = 52</math> <span style="float: right;">M1</span>  <math>[fg + 8f = 52]</math>  <math>fg = 20</math> <span style="float: right;">M1</span>                      [M2 implied by <math>20 + 8f = 52</math> or <math>8f = 32</math>]  <math>f = 4</math> <span style="float: right;">A1 C.A.O.</span></p> <p><math>4 \times g = 20</math> <span style="float: right;">M1 FT 'their f'.</span>  <math>g = 5</math> <span style="float: right;">A1</span></p> <p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanation and working in a way that is clear and logical</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc</li> </ul>

11.(a) 3	B1	• use appropriate terminology, units, etc.
11.(b) unlikely	B1	
11.(c) 	B1	Any indication of $\frac{1}{4}$ to $\frac{1}{2}$ exclusive.

14.(a)	$\frac{1}{6}$		B1	
14.(b)	10		B1	
14.(c)	6 blue 6 yellow 3 pink		B1	

16. ( David – Hr    Jane – Rh    Mary – P )			Allow any unambiguous notation e.g. 'DH'.
David – Hr    Jane – P    Mary – Rh		B2	For all other 5 different combinations.
David – Rh    Jane – Hr    Mary – P			Do not penalise repeats.
David – Rh    Jane – P    Mary – Hr			B1 for 3 or 4 other different combinations.
David – P    Jane – Hr    Mary – Rh			B0 otherwise.
David – P    Jane – Rh    Mary – Hr			

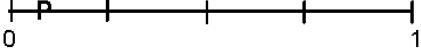
<p>16.(a)</p> 	<p>Any 'blank space' to be taken as 0.</p> <p>B1 For the 4 in correct position.          B1 For the 7 in correct position.</p> <p>B1 For the 3 AND 6 in correct positions.          OR two of the following conditions met          (i) 10 – 'their (non-zero) 7'          (ii) 13 – 'their (non-zero) 7'.          (iii) total of four numbers = 20.          SC1 for all regions correct but using alternative notation e.g. tallies.</p>
<p>16.(b)                    9/20 or equivalent. ISW</p>	<p>B2 B1 for a numerator of 9 (F.T. 'their 3' + 'their 6')          in a fraction &lt; 1.          B1 for a denominator of 20 in a fraction &lt; 1</p>

		3	
17.(a)	0.3(0) on 'box C branch'.	B1	
17.(b)	Sight of $0.45 \times 0.7$ OR $0.25 \times 0.4$ OR $0.3 \times 0.8$ $0.45 \times 0.7 + 0.25 \times 0.4 + 0.3 \times 0.8$ $( 0.315 + 0.1 + 0.24 )$ $= 0.655$ or $131/200$ or equivalent ISW	B1 M1 A1	FT 'their 0.3' from box C branch, only if, between 0 and 1.  Provided less than 1.
17.(c)	$\frac{1}{3}$	B1	F.T. for the fraction that is the nearest to 1- 'their 0.655' provided $0 < \text{their } 0.655 < 1$

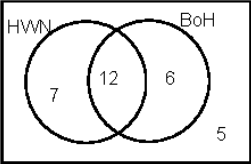
18.(a)	$0.26$		Mark final answer.
18.(b)	$\frac{7}{50} \times 3000$ or equivalent $= 420$	B1 M1 A1	B0 for $13/50$ , $26/100$ etc. Only allow misread if 300 or 30000 used. 420/3000 gains M1A0. Mark final answer.
18.(c)	$\frac{1}{6} \times 3000$ or equivalent $= 500$	M1 A1	Only allow misread if 300 or 30000 used. 500/3000 gains M1A0. Mark final answer. Allow M1A0 for 480 or 510 or 498 as implying

Unit 1: Foundation Tier Summer 2018		
1.(a) 11.5 (cm)	B1	Accept 11.3 - 11.7 (cm)
1.(b) circle with radius 6 cm	B1	
1.(c) 134 (°)	B1	Accept 132 – 136 (°)

2.(c)		7 pints	B1			
3.(a)	-5	-1	1	B2	B2 for all three correct. B1 for one or two correct.	
3.(b)	Correct plots.			P1	FT 'their y-values at $x = -2, 2$ and $4$ '. 2 correct plots sufficient as they are told it's a straight line. Allow $\pm \frac{1}{2}$ a small square'. P0 if any incorrect plot.	
	Straight line from $(-4, -7)$ to $(6, 3)$			L1	CAO no FT. Allow $\pm 1$ small square'. Must be from $(-4, -7)$ to $(6, 3)$ but allow 'extended' line. A correct line gains P1L1.	
3.(c)	$(-4, -7)$	$(6, -7)$	$(6, 3)$	$(-4, 3)$	B2	B2 for all four correct. B1 for three correct. <i>Only award B1 (not B2) if <u>all four correct coordinates given for their extended line</u>.</i> If L0 from a 'shortened <u>correct line</u> ' then FT (for B2 or B1). If L0 from an incorrect line then FT (for B2 or B1) only if a quadrilateral has been <u>drawn using 'their line' as a diagonal</u> .  SC1 for <u>the correct square drawn</u> but no (as incorrect) coordinates given

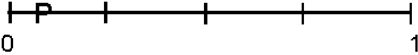
<p>3.(a)      (<i>Summer</i>    <i>Cottage</i>    <i>Train</i>)</p> <p>Summer      Cottage      Bus                  Summer      Cottage      Car                  Summer      Hotel      Train                  Summer      Hotel      Bus                  Summer      Hotel      Car                  Winter      Cottage      Train                  Winter      Cottage      Bus                  Winter      Cottage      Car                  Winter      Hotel      Train                  Winter      Hotel      Bus                  Winter      Hotel      Car</p>	<p>B3</p>	<p>For all other 11 different combinations.                  Ignore repeats.                  B2 for 8, 9 or 10 other different combinations.                  B1 for 5, 6 or 7 other different combinations.</p>
<p>3.(b)</p> 	<p>B1</p>	<p>P must be positioned strictly <math>&gt; 0</math> and <math>&lt; 0.25</math>. C.A.O.                  Accept any indication for position of P.</p>

<p>8.</p> <p>(Volume A =) <math>5 \times 5 \times 5</math> (cm<sup>3</sup>) OR (Volume B =) <math>4 \times 4 \times 5</math> (cm<sup>3</sup>)</p> <p>AND</p> <p>(Volume A =) 125 (cm<sup>3</sup>) (Volume B =) 80 (cm<sup>3</sup>)</p> <p>(Volume of B as a percentage of the volume of A)  <math display="block">= \frac{80}{125} (\times 100\%)</math> <math display="block">= 64(\%)</math></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p>For use of Vol = l × b × h with <u>either</u> A or B.</p> <p>C.A.O. for <u>both</u> volumes. One correct implies previous M1.</p> <p>FT their derived 'volumes'.</p> <p>An answer of 64(%) gains all four marks.</p> <p><i>Allow marks if they work with base areas (as heights are equal) but must explain in order to gain OC1 mark.</i></p>
<p><u>Alternative method</u> (Where 125 cm<sup>3</sup> and 80 cm<sup>3</sup> not shown.)</p> <p><math>5 \times 5 \times 5</math> (cm<sup>3</sup>) OR <math>4 \times 4 \times 5</math> (cm<sup>3</sup>)</p> <p><math>\frac{4 \times 4 \times 5}{5 \times 5 \times 5} (\times 100\%)</math></p> <p><math>= 64(\%)</math></p>	<p>M1</p> <p>M2</p> <p>A1</p>	
<p>Organisation and Communication.</p> <p>Accuracy of writing.</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanation and working in a way that is clear and logical</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> </ul>

<p>11.(a)</p>  <p>12 AND 5 in correct position. Total of 18 for 'Bread of Heaven' Overall total of 30.</p>		<p>Any 'blank space' to be taken as 0. If 'notches/tallies' are used, penalise -1 once.</p> <p>B1 B0 if any other number written in the same section. B1 Allow more than one number in the same section. B1 Allow more than one number in the same section.</p>
<p>11.(b) <math>\frac{19}{30}</math> or equivalent. ISW</p>	<p>B2</p>	<p>B1 for a numerator of 19 <u>OR</u> FT 'their total for HWN' in a fraction &lt; 1. B1 for a denominator of 30 <u>OR</u> FT 'their total' in a fraction &lt; 1. An answer of 19/30 gains B2 regardless of 'their Venn diagram'.</p>



<p>12.(a) <math>5x^2 - 2x - 3x^2 + 6x - 21</math></p> <p style="text-align: center;"><math>= 2x^2 + 4x - 21</math></p>	<p>B2</p> <p>B2</p>	<p>Penalise incorrect notation (e.g. '19 in 30') -1.</p> <p>B1 for sight of <math>5x^2 - 2x</math>.                  B1 for sight of <math>-3x^2 + 6x - 21</math>. Brackets must be removed.                  Allow both of the above B marks even if not part of a single expression.</p> <p><i>FT for B2 if at least two <math>x^2</math> terms AND at least two <math>x</math> terms to be simplified.</i>  <i>FT for B1 if at least two <math>x^2</math> terms OR at least two <math>x</math> terms to be simplified.</i></p> <p>If B2 not awarded, allow                  B1 for correct collection of '<math>x^2</math> terms' (<math>2x^2</math>) OR                  B1 for correct collection of '<math>x</math> terms' (<math>+4x</math>).                  This 2<sup>nd</sup> B2 (or B1) is for their <b>final</b> answer.                  Any compensating errors leading to a 'correct' answer is B0.                  Penalise -1 for any attempt to equate their expression to zero (and attempting to solve) OR                  Incorrectly factorising.</p>
<p>12.(b) <math>22 - f = 3 \times 6</math> or equivalent.  <math>22 - 18 = f</math> OR <math>-f = 18 - 22</math>  <math>f = 4</math></p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>C.A.O.</p> <p>Accept <math>4 = f</math>. M1A1A0 for <math>-f = -4</math>.                  Mark final answer.                  Allow all 3 marks for <math>\frac{22 - 4}{3} = 6</math> with <u>no</u> further work.                  Allow 2 marks for <math>\frac{22 - 4}{3} = 6</math> followed by '<math>f \neq 4</math>'.                  If no marks gained.                  Allow SC1 for an unsupported <math>f = -4</math>.</p>

<p>13.(a) Statement indicating that 0·3 is less than 0·5.  OR Statement indicating that probability of selecting a blue ball should be greater than 0·5.  OR Statement that refers to a proportion of the balls e.g. '(Only) 30% (of the balls) are blue', '(Only) 3/10(th) (of the balls) are blue'.</p>	E1	<p>B0 for e.g. 'Fewer than half the balls are blue'. 'Should be higher', 'Would be above 0·3'.</p> <p>Allow correct interpretation of 0·3 e.g. '(Only) 30 out of 100 are blue', '(Only) 15 out of 50 are blue'.</p> <p>Accept any indication for 0·5, e.g. 'half', '½'.</p>
<p>13.(b) 0·7 or equivalent.</p>	B1	<p>B0 for incorrect notation; e.g. 7 out of 10.</p>
<p>13.(c) <math>0·3 \times 50</math> 15</p>	M1 A1	<p>If no marks gained, allow SC1 for sight of 15; e.g. 15/50, 15:35.</p>

<p>14.(a)      (<i>Summer</i>    <i>Cottage</i>    <i>Train</i>)</p> <p>Summer      Cottage      Bus                  Summer      Cottage      Car                  Summer      Hotel      Train                  Summer      Hotel      Bus                  Summer      Hotel      Car                  Winter      Cottage      Train                  Winter      Cottage      Bus                  Winter      Cottage      Car                  Winter      Hotel      Train                  Winter      Hotel      Bus                  Winter      Hotel      Car</p>	<p>B3</p>	<p>For all other 11 different combinations.                  Ignore repeats.                  B2 for 8, 9 or 10 other different combinations.                  B1 for 5, 6 or 7 other different combinations.</p>
<p>14.(b)</p> 	<p>B1</p>	<p>P must be positioned strictly <math>&gt; 0</math> and <math>&lt; 0.25</math>. C.A.O.                  Accept any indication for position of P.</p>

<p>14.(b) <span style="float: right;">9.6</span></p> <p>15. <math>(QR^2 =) 1.41^2 + 0.89^2</math>  <math>(QR^2) = 2.78(02)</math> or <math>(QR) = \sqrt{2.78(02)}</math>  <math>(QR =) 1.66(\dots)(m)</math> or <math>1.67 (m)</math> or <math>1.7(m)</math>  OR <math>166.7(\dots) \text{ cm}</math> or <math>167\text{cm}</math></p>	<p>B2</p> <p>M1</p> <p>A1</p> <p>A1</p>	<p>Mark final answer. B1 for sight of 3.2.</p> <p>Allow 2.8 for 2.78.</p> <p>FT from M1 for the correctly evaluated square root of 'their 2.78(02)' provided their answer &gt; 1.41</p> <p>Allow working in centimetres but penalise -1 from any A marks gained if units not shown for final answer</p> <p>e.g. <math>QR^2 = 27802 (A1)</math>, <math>QR = 166.74 (A1)</math> then -1 BUT <math>QR = 166.74 \text{ cm}</math> OR <math>167 \text{ cm}</math> is M1A1A1.</p>
<p><u>Alternative method.</u></p> <p>Correct use of 'two-step' trigonometric relationship.</p> <p><math>(QR =) 1.66(\dots)(m)</math> or <math>1.67 (m)</math> or <math>1.7(m)</math>  OR <math>166.7(\dots) \text{ cm}</math> or <math>167\text{cm}</math></p>	<p>M2</p> <p>A1</p>	<p>A partial trigonometric method is M0.</p> <p>C.A.O.</p>

20.(a)	$1 - 0.36 - 0.12 - 0.24$ $= 0.28$	M1 A1	If no marks gained allow SC1 for sight of 9.
20.(b)	$522 \times \frac{1}{3}$ or equivalent (e.g. $522 \div 0.36 \times 0.12$ ) $= 174$	M1 A1	

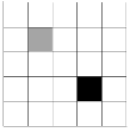
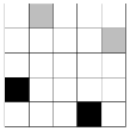
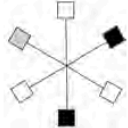
8.(a) 3	B1	
8.(b)(i) 	B1	A should be between $\frac{1}{2}$ and $\frac{3}{4}$ exclusive. B0 if no labels.
8.(b)(ii) 	B1	B should be between $\frac{1}{8}$ and $\frac{3}{8}$ exclusive. Award B1 if no labels and both marks are positioned correctly. [A should be between $\frac{1}{2}$ and $\frac{3}{4}$ exclusive.]

17.(a)	$0.32$	B1	
17.(b) (i)	$600 \times 0.34$ $= 204$	M1 A1	
17.(b)(ii)	$204 - 600/6$ $= 104$	M1 A1	FT 'their 204'. M1A1 for '104 out of 600' BUT M1A0 for '104/600'. FT for A1 provided answer is a positive integer.

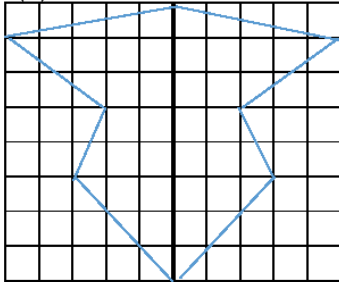
<p>17.(a) 0.92 written on the 'Not a Saturday' branch.                  Sight of <math>1 - 0.15 - 0.45</math> OR <math>0.4</math> or <math>0.40</math>  <math>0.4(0)</math> <u>on</u> both 'car' branches AND <math>0.15</math> AND <math>0.45</math> correctly shown <u>on</u> lower branches.</p>	<p>B1 B1 B1</p>	<p>Allow this B1 if shown on working lines.</p>
<p>17.(b)                  Sight of <math>0.08 \times 0.15</math> OR <math>0.08 \times 0.4</math> or equivalent.  <math>(P(\text{Sat and 'plane or car' }) =) 0.08 \times 0.15 + 0.08 \times 0.4</math>                  or equivalent  <math>= 0.044</math> or equivalent. ISW</p>	<p>B1 M1 A1</p>	<p>FT 'their P(car)' if &lt;1.  <math>0.08 \times 0.55</math> implies previous B1.</p>
<p><u>Alternative method</u>  <math>(P(\text{Sat and 'plane or car' }) =) 1 - (0.92 + 0.08 \times 0.45)</math>                  or equivalent  <math>= 0.044</math> or equivalent. ISW</p>	<p>M2 A1</p>	<p>FT 'their 0.92'.                  M1 for intent  <math>P(\text{Sat and 'plane or car' }) = 1 - P(\text{'not Saturday'}) - P(\text{'Saturday and train'})</math></p>

18. Recognising that each number has a one in five chance of being chosen.	B1	May be expressed in words e.g. '2 (even) numbers out of 5', 'each number has a one in 5 chance' OR as a probability e.g. sight of $\frac{2}{5}$ , '(probability of choosing each ball =) $\frac{1}{5}$ ' <u>B0 if no reference to 'out of 5' or 'in 5'.</u>
(Expected number of even numbers =) $\frac{2}{5} \times 75$ $= 30$	M1 A1	M1 for $\frac{1}{5} \times 75 \times 2$ or equivalent. M1 implies the B1. 30/75 gains B1 M1 A0 if 30 on its own is not shown.

**WJEC GCSE MATHEMATICS**  
**SUMMER 2019 MARK SCHEME**

GCSE Mathematics Unit 1: Intermediate Tier	Mark	Comments															
1. <table border="1" style="margin-left: 20px;"> <tr> <td><math>23 - (4 + 2) \times 3 = 5</math></td> <td>TRUE</td> <td></td> </tr> <tr> <td><math>7/10 + 2/5 = 9/15</math></td> <td></td> <td>FALSE</td> </tr> <tr> <td><math>\frac{1}{2}</math> of <math>1/8 = 1/4</math></td> <td></td> <td>FALSE</td> </tr> <tr> <td>25% of <math>0.4 = 0.1</math></td> <td>TRUE</td> <td></td> </tr> <tr> <td><math>28 - 3 \times 2 + 5 = 55</math></td> <td></td> <td>FALSE</td> </tr> </table>	$23 - (4 + 2) \times 3 = 5$	TRUE		$7/10 + 2/5 = 9/15$		FALSE	$\frac{1}{2}$ of $1/8 = 1/4$		FALSE	25% of $0.4 = 0.1$	TRUE		$28 - 3 \times 2 + 5 = 55$		FALSE	B3	For all 5 correct B2 for 4 correct. B1 for 3 correct
$23 - (4 + 2) \times 3 = 5$	TRUE																
$7/10 + 2/5 = 9/15$		FALSE															
$\frac{1}{2}$ of $1/8 = 1/4$		FALSE															
25% of $0.4 = 0.1$	TRUE																
$28 - 3 \times 2 + 5 = 55$		FALSE															
2.(a) <table border="1" style="margin-left: 20px;"> <tr> <th rowspan="2">Type</th> <th colspan="2">Yellow</th> <th colspan="2">Blue</th> </tr> <tr> <th>&lt;100</th> <th><math>\geq 100</math></th> <th>&lt;100</th> <th><math>\geq 100</math></th> </tr> <tr> <td>Num.</td> <td>(8)</td> <td>7</td> <td>4</td> <td>6</td> </tr> </table>	Type	Yellow		Blue		<100	$\geq 100$	<100	$\geq 100$	Num.	(8)	7	4	6	B2	For all three correct. B1 for 1 or 2 correct. If no marks awarded allow B1 for all correct tallies seen.	
Type		Yellow		Blue													
	<100	$\geq 100$	<100	$\geq 100$													
Num.	(8)	7	4	6													
2.(b) Any valid statement that indicates that the numbers (in the table) are added (to make 25). e.g. 'add the frequency'	E1	Allow 'add them up'. Allow sight of ' $8 + 7 + 4 + 6 (= 25)$ '.															
2.(c) $\frac{8}{25}$ or equivalent ISW	B2	B1 for $x/25$ with $x < 25$ . B1 for $8/y$ with $y > 8$ . Penalise incorrect notation -1. e.g. '8 out of 25', '8 : 25', '8 in 25'.															
3.(a) 	B1																
3.(b) 	B1																
3.(c) 	B1																
4.(a) $-3$ 1	B1 B1	OR FT 'their -3' + 4.															
4.(b)(i)                      21	B1																
4.(b)(ii)                      191	B1																
4.(c) Divide (the previous number) by 3.	E1	Allow '+3'. Do not accept $n+3$ .															

**WJEC GCSE MATHEMATICS**  
**SUMMER 2019 MARK SCHEME**

GCSE MATHEMATICS Unit 1 Foundation Tier	Mark	Comments
1(a) 4523	B1	
1(b) 168	B1	
1(c) 1, 3, 9, 27	B2	B1 for 2 correct and 0 wrong OR B1 for 3 correct and 0 or 1 wrong OR B1 for 4 correct and 1 wrong
2(a) Evidence of counting squares 32 – 42 inclusive  160 – 210 (cm <sup>2</sup> )	M1 A1  B1	FT 'their number of squares' × 5 evaluated correctly Award 3 marks for an unsupported answer between 160 and 210 inclusive. Mark final answer
Accuracy in writing	W1	For W1, candidates will be expected to: <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc</li> </ul>
2(b) 	B1	
3(a) an even chance	B1	
3(b) impossible	B1	
4(a) Correctly drawn tangent	B1	
4(b) Correctly drawn radius	B1	

5(a) 481·63	B1	Do not accept 481·630
5(b) 64	B1	
5(c) 7	B1	Do not accept $7 \times 7$ or $7 \times 7 = 49$ alone.
5(d) (0)·03825	B1	
<b>Ribbon mark 6(a),(b),(c),(d)</b> 6(a) Football	B1	
<b>Ribbon mark 6(a),(b),(c),(d)</b> 6(b) $\frac{1}{4}$ or equivalent ISW	B1	Do not accept incorrect notation; e.g. 1 in 4, 1 out of 4, 1:4.
<b>Ribbon mark 6(a),(b),(c),(d)</b> 6(c) $\frac{1}{4} \times 60$ 15	M1 A1	Accept 15 out of 60. Award SC1 only, for a final answer of 15/60
<b>Ribbon mark 6(a),(b),(c),(d)</b> 6(d) Correctly labelled axes.  Uniform scale starting from zero. Correct equal width bars for football, swimming and tennis.	B1  B1 B1	Vertical axis labelled 'number (of people)' or ' <i>people</i> ' or 'frequency' AND horizontal axis marked with the sports.  Correct heights for 'their scale' (30 and 15) FT their (c) if possible: 'their swimming' = 'their tennis' AND either 'their football' = 2 x 'their tennis' or 'their football' = 60 – 2 x 'their tennis'. If no scale visible, allow final B1 for bars drawn in correct proportions.
7.(Number across = $20 \div 4 =$ 5 OR ( Number down = $6 \div 2 =$ 3 (Total number of small rectangles =) $5 \times 3$ 15	B1 M1 A1	Sight of 5 or 3, not in incorrect statement or working FT 'their stated across and down' CAO
<u>7. Alternative method</u> (Area rectangle A= $2 \times 4 =$ ) 8 ( $cm^2$ ) OR (Area rectangle B= $6 \times 20 =$ ) 120 ( $cm^2$ )  (No. of rectangle A=) $120 \div 8$ 15	B1 M1 A1	Sight of 8 or 120, not in incorrect statement or working FT 'their stated areas' CAO
Organisation and Communication	OC1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanation and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul>

8(a) 5p	B1																
8(b) (i) $(x =) 8$	B1	Accept embedded answer															
8(b) (ii) $(y =) 15$	B1	Accept embedded answer															
8(c) 19	B1	Accept $4 \times 19 (= 76)$ or $19 \times 4 (= 76)$															
9. <table border="1" style="margin-left: 20px;"> <tr> <td><math>23 - (4 + 2) \times 3 = 5</math></td> <td>TRUE</td> <td></td> </tr> <tr> <td><math>7/10 + 2/5 = 9/15</math></td> <td></td> <td>FALSE</td> </tr> <tr> <td><math>\frac{1}{2}</math> of <math>1/8 = 1/4</math></td> <td></td> <td>FALSE</td> </tr> <tr> <td>25% of <math>0.4 = 0.1</math></td> <td>TRUE</td> <td></td> </tr> <tr> <td><math>28 - 3 \times 2 + 5 = 55</math></td> <td></td> <td>FALSE</td> </tr> </table>	$23 - (4 + 2) \times 3 = 5$	TRUE		$7/10 + 2/5 = 9/15$		FALSE	$\frac{1}{2}$ of $1/8 = 1/4$		FALSE	25% of $0.4 = 0.1$	TRUE		$28 - 3 \times 2 + 5 = 55$		FALSE	B3	For all 5 correct B2 for 4 correct. B1 for 3 correct
$23 - (4 + 2) \times 3 = 5$	TRUE																
$7/10 + 2/5 = 9/15$		FALSE															
$\frac{1}{2}$ of $1/8 = 1/4$		FALSE															
25% of $0.4 = 0.1$	TRUE																
$28 - 3 \times 2 + 5 = 55$		FALSE															
10.(a) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">Type</th> <th colspan="2">Yellow</th> <th colspan="2">Blue</th> </tr> <tr> <th>&lt;100</th> <th>≥100</th> <th>&lt;100</th> <th>≥100</th> </tr> </thead> <tbody> <tr> <td>Num.</td> <td>(8)</td> <td>7</td> <td>4</td> <td>6</td> </tr> </tbody> </table>	Type	Yellow		Blue		<100	≥100	<100	≥100	Num.	(8)	7	4	6	B2	For all three correct. B1 for 1 or 2 correct. If no marks awarded allow B1 for all correct tallies seen.	
Type		Yellow		Blue													
	<100	≥100	<100	≥100													
Num.	(8)	7	4	6													
10.(b) Any valid statement that indicates that the numbers (in the table) are added (to make 25) e.g. 'add the frequency'.	E1	Allow 'add them up'. Allow sight of ' $8 + 7 + 4 + 6 (= 25)$ '.															
10.(c) $\frac{8}{25}$ or equivalent ISW	B2	B1 for $x/25$ with $x < 25$ . B1 for $8/y$ with $y > 8$ . Penalise incorrect notation -1; e.g. '8 out of 25', '8:25', '8 in 25'.															
11.(a) $-3$ $1$	B1 B1	OR FT 'their $-3 + 4$ '.															
11.(b)(i) 21	B1																
11.(b)(ii) 191	B1																
11.(c) Divide (the previous number) by 3.	E1	Allow '+3'. Do not accept $n \div 3$ .															

15.(a)	0.32	B1	
15.(b)	Sample number from Anglesey on 2 <sup>nd</sup> day $= 3000 \times 0.42$ $= 1260$  (Rel.Fqu. for two days $=$ ) $\frac{640 + 1260}{2000 + 3000}$ $= 0.38$	M1 A1  M1 A1	Allow M1A1 for sight of 1260 e.g. 1260/3000  FT 'their 1260'.
15.(c)	'Answer to part (b)' noted AND Valid explanation e.g. 'more people sampled'	E1	Explanation must refer to the sample being the largest. Allow e.g 'from both days', 'number of people added', 'frequencies are added'. Do <u>not</u> accept 'relative frequencies are added'.
16.(a)(i)	425 kg	B1	
16.(a)(ii)	21.5 s	B1	
16.(a)(iii)	83 people	B1	
16(b)	$2.38 \times 10^{-2}$	B2	B1 for sight of a correct answer but not in standard form. e.g. $23.8 \times 10^{-3}$ or 0.0238.
17.(a)	$5n < 3n + 7$ or equivalent ISW	B2	$2n < 7$ OR $n < 7/2$ implies B2. Ignore use of a different letter e.g. $5x < 3x + 7$ . Use of ' $\leq$ ' is B1. B1 for sight of $3n + 7$ in an inequality.
17.(b)	$2n < 7$ OR $n < 7/2$  (Greatest amount $=$ ) (£)3	B1  B1	FT 'their inequality' if of equivalent difficulty. May be seen in part (a).  FT 'their $n < k$ '. B0 if they have ' $n > k$ '. B0 if it leads to $n < 1$ An answer of (£)3 gains B1B1 (unless from incorrect algebra work).
18.(a)	0.7 shown for 'Does not go on tour bus'. Use of $0.3 \times \dots = 0.24$ $P(\text{sees show}) = 0.8$  Second set of branches 0.8, 0.2, 0.8, 0.2	B1 M1 A1  A1	Allow M1A1 if 0.8 seen on one of the 'sees show' branches. FT 'their 0.8' <b>only</b> if M1 awarded. (0.24, 0.76, 0.24, 0.76 is MOAOAO)
18.(b)	$0.7 \times 0.2$ $= 0.14$ ISW	M1 A1	FT 'their values' if both between 0 and 1.

3.	$  \begin{array}{r}  (1) \ 5 \ (9) \\  (7) \ (8) \ 2 \\  \hline  9 \ (4) \ (1)  \end{array}  $	B3	B1 for each. No F.T.
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5.(a)	unlikely	B1	
5.(b)	likely	B1	

<p>5. Sight of 6.25 (hrs) OR 375 (min)          (Planning =) <math>\frac{2}{5} \times 6.25</math> OR <math>\frac{2}{5} \times 375</math>  <math>= 2.5</math> (hrs) OR 150 (min)</p> <p>(Remainder of work = <math>6.25 - 2.5</math> OR <math>375 - 150</math>)  <math>3.75</math> (hrs) OR 225 (min)  <math>= 3</math> hours 45 minutes</p>	<p>B1 M1</p>	<p>F.T. 'their time' in hours or in minutes.          May be seen in parts (<math>1/5^{\text{th}}</math> and then <math>2/5^{\text{ths}}</math>)</p> <p>A1 [Note: <math>2/5 \times 6.15</math> OR <math>2/5 \times 615</math> is B0M1(FT)  <math>= 2.46</math>(hrs) OR 246(min) A1(FT)          BUT A0 if 2.46 then used as as 2h 46m ]</p> <p>F.T. 'their derived times' using same units.</p> <p>B1 B1 F.T. correct conversion of 'their times', correct to the nearest minute (rounded or truncated), if of equivalent difficulty.          Allow unambiguous indication of units.</p>
<p><u>Alternative method 1</u>          Sight of 6.25 (hrs) OR 375 (min)          (Remaining work takes) <math>3/5</math> of time  <math>= 3/5 \times 6.25</math> OR <math>3/5 \times 375</math>  <math>= 3.75</math> (hrs) OR 225 (min)  <math>= 3</math> hours 45 minutes</p>	<p>B1 B1 M1 A1 B1</p>	<p>F.T. 'their time' in hours or in minutes.</p> <p>F.T. correct conversion of 'their times', correct to the nearest minute (rounded or truncated), if of equivalent difficulty.          Allow unambiguous indication of units.</p>
<p><u>Alternative method 2</u>          (Planning =) <math>\frac{2}{5} \times 6</math> AND <math>\frac{2}{5} \times 15</math>  <math>= 2.4</math>(hrs) AND 6(min)  <math>= 2</math>hrs 30min          (Remainder of work =) 6(hr) 15(min) - 2(hrs) 30(min)  <math>= 3</math> hours 45 minutes</p>	<p>M1 A1 A1 M1 A1</p>	<p>2.4 hrs may be given as 2hrs 24min.          C.A.O.          F.T. 'their derived planning time' <u>in hours and min.</u></p>
<p><u>Alternative method 3</u>          (Remaining work takes) <math>3/5</math> of time  <math>= \frac{3}{5} \times 6</math> AND <math>\frac{3}{5} \times 15</math>  <math>= 3.6</math>(hrs) AND 9(min)  <math>= 3</math>hrs 36min + 9(min)  <math>= 3</math> hours 45 minutes</p>	<p>B1 M1 A1 M1 A1</p>	<p>3.6 hrs may be given as 3hrs 36min.          F.T. 'their derived times' <u>in hours and min.</u></p>
<p>OCW Organisation and Communication.</p> <p>Accuracy of writing.</p>	<p>OC1 W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanation and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc</li> </ul>

	(Bearing = ) 130(°)	B1	OR FT 90 + 'their x'. Must be in 3 digit form.
6.(a)	9	B1	
6.(b)	$\frac{3}{14}$ ISW	B2	B1 for $x/14$ if $x < 14$ . B1 for $3/y$ if $y > 3$ . Penalise -1 for incorrect notation, e.g. 3 out of 14, $3 \div 14$ , $3 : 14$ etc.

11.(a)	$1 - (0.2 + 0.3 + 0.25 + 0.15)$ or equivalent $= 0.1$ or equivalent.	M1 A1	• use appropriate terminology, units, etc
11.(b)	$0.3 \times 200$ or equivalent.	M1 A1	A final answer of 60/200 implies M1A1



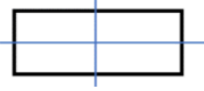
16.(a)	9	B1	
16.(b)	$\frac{3}{14}$ ISW	B2	B1 for $x/14$ if $x < 14$ . B1 for $3/y$ if $y > 3$ . Penalise -1 for incorrect notation, e.g. 3 out of 14, $3 + 14$ , $3 : 14$ etc.

<p><u>Alternative method 1</u>                      Sight of 6.25 (hrs) OR 375 (min)                      (Remaining work takes) <math>\frac{3}{5}</math> of time  <math>= \frac{3}{5} \times 6.25</math> OR <math>\frac{3}{5} \times 375</math>  <math>= 3.75</math> (hrs) OR 225 (min)  <math>= 3</math> hours 45 minutes</p>	<p>B1                      B1                      M1                      A1                      B1</p>	<p>F.T. 'their time' in hours or in minutes.                      F.T. correct conversion of 'their times', correct to the nearest minute (rounded or truncated), if of equivalent difficulty.                      Allow unambiguous indication of units.</p>
<p><u>Alternative method 2</u>                      (Planning =) <math>\frac{2}{5} \times 6</math> AND <math>\frac{2}{5} \times 15</math>  <math>= 2.4</math>(hrs) AND 6(min)  <math>= 2</math>hrs 30min                      (Remainder of work =) 6(hr) 15(min) - 2(hrs) 30(min)  <math>= 3</math> hours 45 minutes</p>	<p>M1                      A1                      A1                      M1                      A1</p>	<p>2.4 hrs may be given as 2hrs 24min.                      C.A.O.                      F.T. 'their derived planning time' in hours and min.</p>
<p><u>Alternative method 3</u>                      (Remaining work takes) <math>\frac{3}{5}</math> of time  <math>= \frac{3}{5} \times 6</math> AND <math>\frac{3}{5} \times 15</math>  <math>= 3.6</math>(hrs) AND 9(min)  <math>= 3</math>hrs 36min + 9(min)  <math>= 3</math> hours 45 minutes</p>	<p>B1                      M1                      A1                      M1                      A1</p>	<p>3.6 hrs may be given as 3hrs 36min.                      F.T. 'their derived times' in hours and min.</p>
<p>16.(a) Attempt at <math>323 + 217</math> AND <math>122 + 58</math>  <math>= 3 : 1</math></p>	<p>B1                      B2</p>	<p>Allow for an attempt at adding the correct two pairs of numbers.                      B1(plus previous B1) for a ratio equivalent to 3 : 1 e.g. 540 : 180.                      Allow B1B1 for a final answer of 1 : 3.                      If no marks gained allow SC1 for a final answer of 89 : 55 OR 55 : 89 (Llandudno : Aberystwyth ratio.)</p>
<p>16.(b) <math>\frac{445}{720}</math> ISW <math>\left(\frac{89}{144}\right)</math></p>	<p>B2</p>	<p>0.618(...) or 0.62 or 61.8(...) or 62% implies B2.                      B1 for <math>x/720</math> if <math>x &lt; 720</math>.                      B1 for <math>445/y</math> if <math>y &gt; 445</math>.                      Allow B1 for 0.61 or 61%.                      Penalise -1 for incorrect notation, e.g. 445 out of 720.</p>
<p>17.(a)  <math>12x + 8 = 12</math> OR <math>3x + 2 = 3</math>  <math>12x = 4</math> OR <math>3x = 1</math>  <math>x = \frac{4}{12}</math> OR <math>x = \frac{1}{3}</math></p>	<p>B1                      B1                      B1</p>	<p>F.T. until 2<sup>nd</sup> error.                      Adding 'unlike terms' eg <math>12x + 8 = 20x</math> or <math>3x + 2 = 5x</math> to be taken as two errors.                      Mark final answer. Allow 0.33(33...)                      A final answer of 0.3 is (B1B1)B0.</p>
<p>17.(b) <math>3x + 10x</math>  <math>13x</math> (pence)</p>	<p>B2                      B1</p>	<p>B1 for <math>3x + 5 \times 2x</math> OR for sight of <math>10x</math>                      Mark final answer.</p>
<p>18. <math>a = 123^\circ</math>  <math>b = 57^\circ</math>  <math>c = 74^\circ</math></p>	<p>B1                      B1                      B1</p>	<p>OR F.T. <math>180 - a</math>.</p>

	<i>Line drawn</i>	<i>A1</i>	
17.(a)	<p>0.3 shown for                      'Does not visit 'Erddig Gardens'.                      Use of <math>0.7 \times \dots = 0.28</math>                      P(goes to 'Bersham Heritage Centre') = 0.4                      Second set of branches 0.4, 0.6, 0.4, 0.6</p>	<p>B1                       M1                      A1                      A1</p>	<p>Implied by sight of 0.4                      (on 'top branch' of the four on the right.)                      FT 'their 0.4' BUT <b>dependent</b> on M1 gained.                      (i.e. MOAOAO for 0.28 and 0.72 on branches.)</p>
17.(b)	<p><math>0.7 \times 0.6</math>   <math>= 0.42</math>    <i>ISM</i></p>	<p>M1                       A1</p>	<p>FT <math>0.7 \times</math> 'their 0.6' only if <math>0 &lt; \text{'their 0.6'} &lt; 1</math>   <math>0.42</math> <i>ISM</i> M1A1</p>

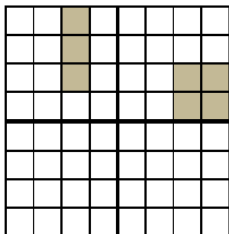
<p>19.</p> <p>(Area of ABCF =) <math>91 = 7 \times CF</math>  <math>(CF = 91/7 =) 13 \text{ (cm)}</math></p> <p>(Area CDEF =) <math>\frac{(13 + 8) \times 6}{2}</math></p> <p><math>= 63 \text{ (cm}^2\text{)}</math></p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p>	<p><i>Lengths may be shown on the diagram.</i></p> <p>Allow AB shown as 13 (cm) for M1 A1.          Allow an embedded 13 e.g. <math>7 \times 13 = 91</math> for M1 A1.          If '13' <u>seen</u> to come from '6 + 7' then M0 A0.</p> <p>FT 'their stated or shown length CF'.          Must be equal to AB if only AB calculated.          Allow M1 for correct intent <u>seen</u>. e.g.  <math>13 + 8 \times 6 \div 2</math>          (M0 if only unsupported answer of 37 given.)</p>
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**WJEC GCSE MATHEMATICS**  
**AUTUMN 2020 MARK SCHEME**

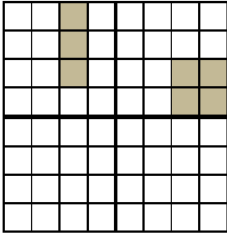
GCSE MATHEMATICS Unit 2: Foundation Tier	Mark	Comments
1.                    1.98 53 5.88 0.41	B1 B1 B1 B1	Ignore spurious units
2.(a) 3 700 000	B1	
2.(b) 9998	B1	
2.(c) 1, 3, 5 and 15	B2	Ignore repeats. Allow $1 \times 15$ and $3 \times 5$ . B1 for 2 correct factors with none incorrect, OR for 3 or 4 correct with no more than one incorrect.
3.(a)                unlikely	B1	
3.(b) 20	B1	
3.(c) Rolling a 1 on the dice	B1	
4.(a) 	B2	B1 for two correct lines with one incorrect line OR for one correct line with no incorrect lines.
4.(b) (an) equilateral (triangle)	B1	
5.(a) 102 OR 120	B1	
5.(b) 201 OR 210	B1	
6. Three different even numbers with a sum of 24, not including 8. Possible solutions are 2, 4 (and) 18 2, 6 (and) 16 2, 10 (and) 12 4, 6 (and) 14	B3	In any order. Allow inclusion of negative numbers.  If B3 not awarded, award B2 for three numbers which sum to 24 which satisfy two of the three conditions: <ul style="list-style-type: none"> <li>• The numbers are different</li> <li>• The numbers are even</li> <li>• None of the numbers is 8</li> </ul> If B2 not awarded, award B1 for three numbers which sum to 24.
7.(a) 0.12 or $\frac{3}{25}$ or equivalent	B1	
7.(b) $\frac{3}{5} \times 632$ or equivalent = 379.2	M1  A1	Award M1 A0 for $1896/5$ or $379\frac{1}{5}$ .
7.(c) 2.5	B1	
8. $\frac{3}{10}$ 30  $\frac{9}{(20)}$ 0.45	B1 B1  B1 B1	Accept 30/100 for 3/10

**WJEC GCSE MATHEMATICS**

**AUTUMN 2020 MARK SCHEME**

GCSE Mathematics Unit 2 Intermediate Tier	Mark	Comments
1.(a)(i) 16	B1	
1.(a)(ii) 2160	B2	B1 for sight of 2155(-.....) OR 2150 OR 2156. Mark final answer.
1.(b) $0.62 \times 7.8$ or equivalent. = 4.836 ISW	M1 A1	Unsupported 4.8.... implies M1. Accept $4^{209}/_{250}$ (ISW). Allow 1209/250 (ISW)
1.(c)(i) 247	B1	
1.(c)(ii) 2197	B1	
2.(a) 6 -5	B2	B1 for 6. B1 FT for correct evaluation of 'their 6' – 11 <b>only</b> if it leads to a <b>negative</b> answer.
2.(b) 15	B2	B1 for sight of 28.8 OR -13.8. Mark final answer.
3. $\frac{400}{17.5}$ or $\frac{4}{0.175}$ . = 22.8(....) or 22.9  (Number of rods =) 22	M2 A1 B1	M1 if incorrect place value (in either length). Digits 228..... implies M1. C.A.O.  FT if of equivalent difficulty. (i.e. 'their 22.8' must be greater than 1 AND their 1 <sup>st</sup> decimal place number greater than or equal to 5.) Answer of 22 gains all 4 marks. Unsupported answer of 23 gains M2A0B0.
3. <u>Alternative method (trial and improvement)</u> Working with a multiple of 17.5 or 0.175. ( $n \times 17.5$ or $n \times 0.175$ ) $22 \times 17.5 (= 385)$ or $22 \times 0.175 (= 3.85)$ $23 \times 17.5 (= 402.5)$ or $23 \times 0.175 (= 4.025)$  (Number of rods =) 22	S1 B1 B1 B1	Award this S1 only if $n > 2$ and $n \neq 4$ and $n \neq 400$ . This implies previous S1. This implies previous S1 and previous B1 if 402.5 seen. Must be seen in answer space or unambiguously identified (not simply embedded). Answer of 22 gains all 4 marks. Unsupported answer of 23 gains S1B0B1B0.
4.(a) All labels correctly inserted (Number) 1 2 3 4 5 Red Yellow (Colour) (Pink)  All outcomes correctly inserted	B1  B1	Must be inserted in the table and not simply inferred from the outcomes.  Accept 'R' for Red and 'Y' for Yellow.  Allow 'Red' for 'R' etc. Allow '1R' for 'R1' etc.
4.(b) $\frac{2}{15}$ or equivalent ISW.	B2	(No FT from an incorrect grid in 4a) B1 for a numerator of 2 in a fraction < 1. B1 for a denominator of 15 in a fraction < 1. Allow B2 for 0.13... Penalise -1 for incorrect notation eg '2 out of 15', '2 : 15' etc.
5.(a) 	B2	B1 for either individual shape. Ignore clearly deleted shading.



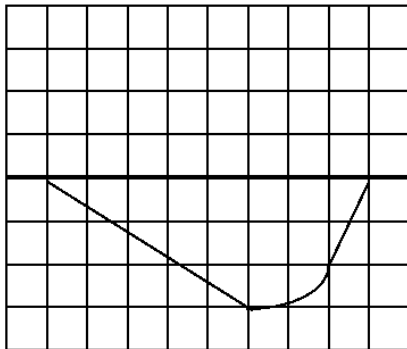
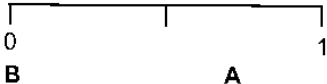
<p>13.(a)</p> 	<p>B2</p>	<p>B1 for each individual shape. Ignore clearly deleted shading.</p>
<p>13.(b) Reflection (in the line) <math>x = 5</math></p>	<p>B2</p>	<p>B1 for stating 'Reflection'. Ignore extra wording once 'reflection' (or 'reflected') seen. B1 for stating <math>x = 5</math> (simply drawing the line is B0)</p>
<p>14.(a) <math>10x + 15 = 20</math> OR <math>2x + 3 = 4</math>  <math>10x = 5</math> OR <math>2x = 1</math>  <math>x = \frac{5}{10}</math> OR <math>x = \frac{1}{2}</math> or equivalent</p>	<p>B1 B1 B1</p>	<p>FT until 2<sup>nd</sup> error. Mark final answer. Allow an embedded answer but penalise -1 if contradicted by <math>x \neq \frac{1}{2}</math> or 0.5.</p>
<p>14.(b) <math>5(n - 3)</math> or <math>5 \times (n - 3)</math> or <math>(n - 3)5</math>  or <math>(n - 3) \times 5</math> or <math>5n - 15</math></p>	<p>B2</p>	<p>B1 for sight of <math>n - 3 \times 5</math> OR sight of <math>5 \times n - 3</math>. B0 for unsupported <math>n - 15</math> OR unsupported <math>5n - 3</math>. Allow '<math>n = 5(n - 3)</math>' etc Mark final answer.</p>
<p>15.(a) YES  AND a valid explanation.  e.g. 'the other two angles would be (both) <math>20^\circ</math>'  e.g. diagram showing (isosceles) triangle with angles of <math>140^\circ</math>, <math>20^\circ</math> and <math>20^\circ</math>.</p>	<p>E1</p>	<p>A valid explanation implies YES circled if not otherwise contradicted (by circling NO).   Explanations must engage with the specific triangle given (with an angle of <math>140^\circ</math>) and not isosceles triangles in general.</p>
<p>15.(b) <math>a + b = 150</math></p>	<p>B1</p>	
<p>16.  <math>[n(G \cap S) =] \quad 10</math>  <math>[n(S) =] \quad 13</math></p>	<p>B1 B1</p>	<p>Entries must be a whole numbers.  <math>[n(\mathcal{E})]</math> must be 30 (i.e. no additional 'non-Spanish').  Any blank space to be taken as 0.</p>
<p>17. (Length of AD or BC =) 10 (cm)    (Area of ABCD = <math>5 \times 10 =</math>) 50 (cm<sup>2</sup>)    (Area APB =) <math>\frac{\pi \times 5^2}{4}</math>  = 19.6(.....)(cm<sup>2</sup>)    (Shaded area = <math>50 - 19.6 =</math>) 30.3(...) or 30.4(cm<sup>2</sup>)</p>	<p>B1 B1 M1 A1 B1</p>	<p>May be seen on the diagram or implied in later work.  FT <math>5 \times</math> 'their AD (or BC)'.  The 50(cm<sup>2</sup>) may be shown as two areas of 25(cm<sup>2</sup>) for B1 B1.  SC1 for sight of <math>\pi \times 5^2</math> or equivalent (78.5.....)  FT 'their stated area ABCD' – 'their stated <u>area</u> APB'  <i>Note: Sight of (25 – 'area of APB') + 25 implies the first two B marks. [rectangle divided in half]</i></p>



**WJEC GCSE MATHEMATICS**  
**AUTUMN 2021 MARK SCHEME**

Unit 2: Foundation Tier	Mark	Comments																
1.(a) 5169	B1																	
1.(b) 6502	B1																	
1.(c) 186	B1																	
1.(d) 45	B1																	
2.(a) 5, 5, 5, 5	B1																	
2.(b) Exactly two 3s and any other two numbers	B1	Accept in any order.																
2.(c) Exactly one 2 and any other three numbers	B1	Accept in any order.																
3.(a) 40 065	B1																	
3.(b) 5400	B1																	
4.(a) rhombus	B1																	
4.(b) equilateral triangle	B1																	
5. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><b>71</b></td> <td>60</td> <td>78</td> <td><b>41</b></td> </tr> <tr> <td>26</td> <td><b>85</b></td> <td>27</td> <td>112</td> </tr> <tr> <td>95</td> <td>105</td> <td><b>42</b></td> <td>8</td> </tr> <tr> <td>58</td> <td>0</td> <td>103</td> <td><b>89</b></td> </tr> </table>	<b>71</b>	60	78	<b>41</b>	26	<b>85</b>	27	112	95	105	<b>42</b>	8	58	0	103	<b>89</b>	B3	B2 for 3 rows or 3 columns with a total of 250. B1 for 1 or 2 rows or 1 or 2 columns with a total of 250.
<b>71</b>	60	78	<b>41</b>															
26	<b>85</b>	27	112															
95	105	<b>42</b>	8															
58	0	103	<b>89</b>															
6.(a) 98	B1																	
6.(b) Subtract 13 (from the previous term)	B1	Accept -13, goes down in 13s, etc.																
6.(c) x-2 (years old)	B1	Mark final answer.																
7.(a) Sum of numbers (262)  Sum of numbers $\div$ 4 65.5 or equivalent	M1  m1 A1	Allow for an unsupported value between 173 and 351. Award this m1 for 'their sum' $\div$ 4 CAO. Allow 131/2.  If no marks awarded, allow SC1 for (64 + 89 + 83 + 26 $\div$ 4 =) 242.5 or equivalent.																
7.(b) (65.5 + 1 =) 66.5	B1	F.T. 'their mean' from (a). Allow 133/2.																
8.(a) 23.04	B1	Accept $23 \frac{1}{25}$ or equivalent e.g. 576/25																
8.(b) 7.9	B1	Accept $7 \frac{9}{10}$ or equivalent e.g. 79/10																
8.(c) $0.04 \times 325$ or equivalent = 13 ISW	M1 A1																	
9. (Oliver's number is) 90	B3	B2 for a final answer <u>between 40 and 95</u> satisfying 2 of the 3 conditions. (45, 54, 60, 72) B1 for a final answer <u>between 40 and 95</u> satisfying only 1 of the 3 conditions. (40, 42, 44, 46, 48, 50, 52, 56, 58, 62, 63, 64, 66, 68, 70, 74, 75, 76, 78, 80, 81, 82, 84, 86, 88, 92, 94)																
OC Organisation and Communication.	OC1	For OC1, candidates will be expected to: <ul style="list-style-type: none"> <li>present their response in a structured way</li> <li>explain to the reader what they are doing at each step of their response</li> <li>lay out their explanation and working in a way that is clear and logical</li> <li>write a conclusion that draws together their results and explains what their answer means</li> </ul>																

**WJEC GCSE MATHEMATICS**  
**AUTUMN 2021 MARK SCHEME**

Unit 1: Foundation Tier	Mark	Comments
1.(a) Ninety-five thousand and forty-eight	B1	
1.(b) 931	B1	
1.(c) 1250	B1	
1.(d) 208	B1	
1.(e) 1,2,3,6,9,18	B2	B1 for 4 or 5 correct and 0 incorrect B1 for 5 or 6 correct and 1 incorrect Ignore repeated numbers Accept products 1×18, 2×9, 3×6
2.(a) 94 (mm)	B1	Accept 92 to 96 (mm)
2.(b) 136(°)	B1	Accept 134 to 138 (°)
3.(a) 16	B1	
3.(b) $\frac{3}{4}$	B1	Mark final answer.
3.(c) 28	B1	
4. 	B2	B1 for correct longer straight line. B1 for correct curve AND shorter straight line. The lines must pass through the correct points.
5.(a) $4.3 \times 1000$ 4300 (g)	M1 A1	
5.(b) $3 \times 100 \div 6$ 50 (cm)	M1 A1	If M0 A0, award SC1 for sight of 300(cm) or 0.5(m).
6. 	B1 B1	A should be between 0.6 and 0.8 B should be at 0

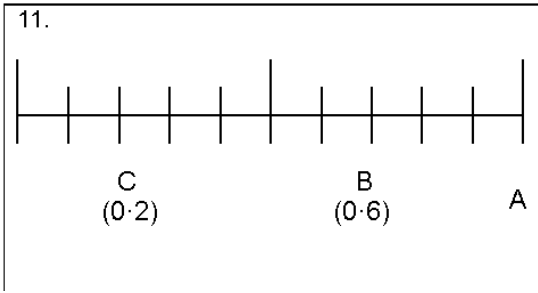


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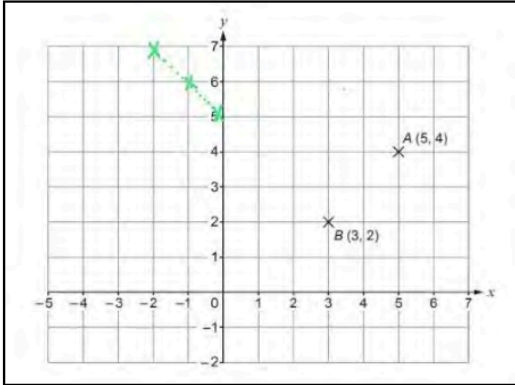
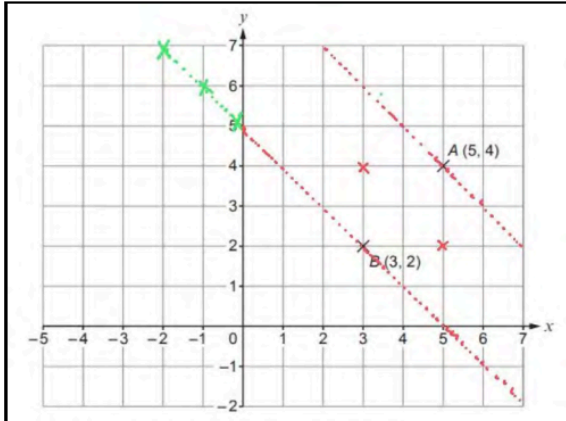
2. (a)	unlikely	B1	
2. (b)	an even chance	B1	

<p>3.</p> $2.73 \text{ (pints)} \div 1.75 \text{ or } 2.73 \text{ (pints)} \times \frac{4}{7}$ $1.56 \text{ (litres)}$ $1.615(0) \text{ (litres)}$ $1.25 + 1.56 + 1.615$ $\div 3$ $1.475 \text{ (litres) or } 1.47 \text{ (litres) or } 1.48 \text{ (litres)}$	<p>M1 A1</p> <p>B1</p> <p>M1</p> <p>m1 A1</p>	<p><b>Answer lines take precedence</b></p> <p>Allow use of 568ml or 570ml <math>\approx</math> 1 pint leading to an answer of 1.55 or 1.56.</p> <p>(= 4.425) FT 1.25 + 'their 1.56' + 'their 1.615'. Award M1 for 1.25 + 2.73 + 1615.</p> <p>Allow 1.5 (litres) from correct working.</p> <p>Note: An answer of (1618.98/3 =) 539.66 or 540 or 539.6 or 539.7 implies M1m1A1.</p>
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<p>6. (a) <math>(P(\text{green or yellow}) = ) 0.7</math> or equivalent  <math>(P(\text{yellow}) = ) 0.35</math> or equivalent ISW</p>	<p>B1 B1</p>	<p>FT 'their 0.7' <math>\div 2</math>, provided not 0.3 and less than 1.           If no marks awarded, award SC1 for  <math>P(\text{red}) + P(\text{green}) + P(\text{yellow}) = 1</math>.</p>
<p>6. (b) Any valid explanation          e.g. "as there are 10 balls, the only possible probabilities are 0.1, 0.2, 0.3 etc"          "you can't have 2.5 balls"          "a quarter of 10 is not a whole number"          "0.25 of 10 = 2.5, you can't have half a ball"          "10 is not divisible by 4"</p>	<p>E1</p>	<p>Accept "you can't have half a ball".          Allow sight of 2.5 for E1.           Do not accept incomplete explanations          e.g. "we don't know how many blue (or white) balls there are".</p>



B1 A marked at 1  
 B1 B marked at 0.6 (accept 0.55 to 0.65 exclusive)  
 B1 C marked at 0.2 (accept 0.15 to 0.25 exclusive)

<p>12. (a) (1, 0)</p>	<p>B2</p>	<ul style="list-style-type: none"> <li>• use appropriate terminology, units, etc</li> </ul> <p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> <li>• if C clearly identified on grid but coordinates not given or are incorrect</li> <li>• for an answer of (4, 3) (midpoint of AB)</li> <li>• for an answer of (1x, 0y) and point not identified.</li> </ul>
<p>12. (b) (-1, 6) OR (-2,7)</p> 	<p>B2</p>	<p>Award B2 for any point that satisfies the conditions e.g. (-1.5, 6.5)</p> <p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> <li>• if D identified on grid in a correct position but coordinates not given or are incorrect OR</li> <li>• for the coordinates of any point that creates a right-angled triangle with AB as one side</li> </ul> <p>e.g.</p> <p>(0,5) (1,4) (2,3) (4,1) (5,0) (6,-1) (7,-2)</p> <p>(3,4) (5,2)</p> <p>(2,7) (3,6) (4,5) (6,3) (7,2)</p> 

<p>(Expected number of winners = <math>\frac{7}{12} \times 228</math>)                  133 (winners)</p>	<p>B1</p>	<p>If <math>\frac{7}{12}</math> or correct % or decimal seen in part (c), it must be used for this B1.                  FT 'their <math>\frac{7}{12}</math>' if less than <math>1 \times 228</math>                  Allow <math>\frac{133}{228}</math> or '133 out of 228'                  Must be whole number                  Award B0 for  <math>\frac{7}{12} \times 228 = 0.58(333\dots) \times 228 = 132</math> winners.                  Award B0 for  <math>\frac{7}{12} \times 228 = 0.6 \times 228 = 136</math> or 137 winners.</p>
<p>(Expected number that don't win = <math>228 - 133</math>)                  95 (non-winners)</p>	<p>B1</p>	<p>FT 228 – 'their 133' (provided &lt; 228)</p>
<p>(Amount taken = <math>95 \times \text{£}2.50 =</math>)      (£)237.5(0)</p>	<p>B1</p>	<p>FT <math>\text{£}2.50 \times</math> 'their 95' provided &lt; 133</p>
<p>(Expected profit = <math>95 \times \text{£}2.50 - 133 \times \text{£}1 =</math>)                  (£)104.5(0)</p>	<p>B1</p>	<p>(£)237.5(0) – (£)133                  FT 'their (£)237.5(0)' – 'their (£)133'                   Award B1B1B1B0 for sight of  <math>95 \times \text{£}2.50 - 133 \times \text{£}1</math> with an incorrect final answer.                   If the FT results in a loss, the 'Loss' must be stated, or the</p>

<p>14. (a) 0.4 shown on 'A does not occur' branch                  Use of <math>0.6 \times \dots = 0.48</math>  <math>P(B \text{ occurs}) = 0.8</math></p> <p>Second set of branches 0.8, 0.2, 0.8, 0.2</p>	<p>B1                  M1                  A1                   A1</p>	<p>Allow M1A1 if 0.8 seen on one of the 'B occurs' branches.</p> <p>FT 'their 0.8' only if M1 awarded.                  (0.48, 0.52, 0.48, 0.52 is M0A0A0)</p>
<p>14. (b) <math>0.4 \times 0.2</math></p> <p style="text-align: center;"><math>= 0.08</math> ISW</p>	<p>M1                  A1</p>	<p>FT 'their 0.4' <math>\times</math> 'their 0.2' provided both between 0 and 1.</p>

16. (a) $(P(\text{green or yellow}) = ) 0.7$ or equivalent $(P(\text{yellow}) = ) 0.35$ or equivalent ISW	B1 B1	FT 'their 0.7' $\div 2$ , provided not 0.3 and less than 1  If no marks awarded, award SC1 for $P(\text{red}) + P(\text{green}) + P(\text{yellow}) = 1$
16. (b) Any valid explanation e.g. "as there are 10 balls, the only possible probabilities are 0.1, 0.2, 0.3 etc" "you can't have 2.5 balls" "a quarter of 10 is not a whole number" "0.25 of 10 = 2.5, you can't have half a ball" "10 is not divisible by 4"	E1	Accept "you can't have half a ball". Allow sight of 2.5 for E1.  Do not accept incomplete explanations e.g. "we don't know how many blue (or white) balls there are".

2. $-36 \cdot 2$	B2	Mark final answer. Award B1 for one of the following: <ul style="list-style-type: none"><li>• sight of <math>-64 \cdot 4</math> (not <math>-64 \cdot 4p</math>)</li><li>• sight of <math>(+)28 \cdot 2</math> (not <math>28 \cdot 2q</math> and not <math>-28 \cdot 2</math>)</li><li>• <math>-36 \cdot 2</math> (with additional letters).</li></ul>
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8.(a) $1 - (0.08 + 0.2 + 0.28)$ or equivalent $= 0.44$ or equivalent.	M1 A1	For the complete method.  If no marks awarded, award SC1 for 55 pupils for Ysgol Bryn.
8.(b) $0.28 \times 125$ or equivalent. $= 35$ ISW	M1 A1	Unsupported $35/125$ or equivalent implies M1A0.



<p>13.(b) Pie chart drawn correctly and both sectors labelled correctly Angle for Red = <math>100^\circ</math> Angle for Yellow = <math>80^\circ</math></p>	B2	<p>For B2, FT their angles from (a), provided they add up to <math>180^\circ</math>. Allow tolerance of <math>\pm 2^\circ</math> for all angles. Award B1 for one of the following:</p> <ul style="list-style-type: none"><li>• correct angles but both not correctly labelled (1 or 2 omitted or reversed)</li><li>• one correct angle (from FT) and correctly labelled.</li></ul>
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13.(c)  $\frac{70}{90}$  OR  $\frac{7}{9}$  OR  $\frac{280}{360}$  or equivalent. ISW

B2

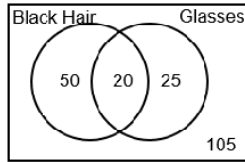
FT 'their 45' + 25 or 'their 100°' + 180°, where possible.

Award B1 for one of the following:

- a numerator of 70 or 280 in a fraction < 1
- a denominator of 90 or 360 in a fraction < 1
- sight of adding two correct fractions for red and blue.

Penalise incorrect notation (e.g. '70 in 90') -1.

14.(a)



20 AND 105 in correct position  
Total of 70 for *Black Hair*

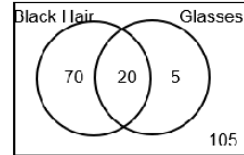
Overall total of 200

If 'notches/tallies' are used, penalise -1 once.

B1 B0 if any other number written in the same section.  
B1 FT 'their 50' + 'their 20', provided both are non-zero values.

B1

Note:  
The answer below is awarded B1B0B1.



14.(b)  $\frac{45}{200}$  or  $\frac{9}{40}$  or equivalent. ISW

B2 For B2 or B1, the numerator and denominator must be a whole number.

FT 'their 20' + 'their 25' provided both sections not 200

blank.

Award B1 for one of the following:

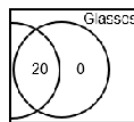
- a numerator of 45 in a fraction < 1
- FT 'their 20' + 'their 25', provided both sections are not blank, as a numerator in a fraction < 1
- a denominator of 200 in a fraction < 1.

An answer of  $\frac{45}{200}$  gains B2 regardless of 'their 200'

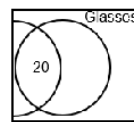
Venn diagram'.

Penalise incorrect notation (e.g. '45 in 200') -1.

Note:



An answer of  $\frac{20}{200}$  is awarded B2.



An answer of  $\frac{20}{200}$  is awarded B1.

16.(b)	$0.28 \times 125$ or equivalent. = 35 ISW	M1 A1	Unsupported $35/125$ or equivalent implies M1A0.
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<p>18. (a) Complete diagram</p>	<p>B2 Award B1 for <b>one</b> of the following:</p> <ul style="list-style-type: none"> <li>• 2/5 or equivalent on 'Blue' Bag A branch</li> <li>• 0.75 or equivalent on a correct 'Blue' Bag B branch.</li> </ul>
<p>18. (b)</p> <p>Sight of <math>\frac{3}{5} \times 0.25</math> <b>OR</b> <math>\frac{2}{5} \times 0.75</math> or equivalent</p> <p><math>\frac{3}{5} \times 0.25 + \frac{2}{5} \times 0.75</math> or equivalent</p> <p>0.45 or 9/20 or equivalent ISW</p>	<p>Check diagram for answers.</p> <p>FT 'their 2/5' from bag A blue branch, only if between 0 and 1.</p> <p>FT 'their 0.75' from bag B blue branch, only if between 0 and 1.</p> <p>B1 Award B1 for sight of 0.15 <b>OR</b> 0.3 or equivalent.</p> <p>M1 Award M1 for 0.15 + 0.3.</p> <p>A1 Only FT, provided answer is less than 1.</p>

<p>5.(a) Correctly drawn pie chart within tolerance <b>AND</b> correctly labelled</p> <p><b>Red</b> = 72(°) (allow 70° to 74°) <b>Green</b> = 108(°) (allow 106° to 110°)</p>	<p>B3</p>	<p>Award B2 for one of the following:</p> <ul style="list-style-type: none"> <li>correctly drawn pie chart within tolerance but not labelled or incorrectly labelled</li> <li>pie chart drawn within tolerance but not a straight line</li> <li>pie chart drawn not starting from the centre (but with end point within tolerance)</li> <li>sight of red = 72(°)</li> <li>sight of green = 108(°).</li> </ul> <p>Award B1 for sight of one of the following:</p> <ul style="list-style-type: none"> <li>72(°)</li> <li>108(°)</li> <li>(red=) <math>\frac{2}{10} \times 360</math> or equivalent</li> <li>(red=) <math>\frac{2}{5} \times 180</math> or equivalent</li> <li>(green=) <math>\frac{3}{10} \times 360</math> or equivalent</li> <li>(green=) <math>\frac{3}{5} \times 180</math> or equivalent</li> <li>'their <b>derived</b> 72' and 'their <b>derived</b> 108' drawn correctly, provided that 'their 72' + 'their 108' = 180 and identified as red and green, and not 90°.</li> </ul>																				
<p>5.(b) D A C B</p>	<p>B2</p>	<p>Award B2 for writing the correct fractions in order</p> $\frac{1}{7} \quad \frac{1}{6} \quad \frac{1}{4} \quad \frac{1}{2}$ <p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> <li>sight of correct fractions</li> <li>BCAD (reversed order)</li> </ul> <table border="1" data-bbox="852 1126 1422 1294"> <thead> <tr> <th>DCB in order</th> <th>DAC in order</th> <th>DAB in order</th> <th>ACB in order</th> </tr> </thead> <tbody> <tr> <td>ADCB</td> <td>BDAC</td> <td>CDAB</td> <td>ADCB</td> </tr> <tr> <td>DCAB</td> <td>DBAC</td> <td>DCAB</td> <td>ACDB</td> </tr> <tr> <td>DCBA</td> <td>DABC</td> <td>DABC</td> <td>ACBD</td> </tr> <tr> <td>DCB</td> <td>DAC</td> <td>DABC</td> <td>ACB</td> </tr> </tbody> </table> <p>Do not accept repeated letters.</p>	DCB in order	DAC in order	DAB in order	ACB in order	ADCB	BDAC	CDAB	ADCB	DCAB	DBAC	DCAB	ACDB	DCBA	DABC	DABC	ACBD	DCB	DAC	DABC	ACB
DCB in order	DAC in order	DAB in order	ACB in order																			
ADCB	BDAC	CDAB	ADCB																			
DCAB	DBAC	DCAB	ACDB																			
DCBA	DABC	DABC	ACBD																			
DCB	DAC	DABC	ACB																			

7. Sight of $0.3 \times 20$ or equivalent  6	M1  A1	Award M1 only for $3/10 = 6/20$ without a final answer of 6. Allow $3/10$ of 20 for M1. If candidates calculate the number of apples, bananas and lemons, they must clearly indicate numbers of apples = 6. Allow 6 out of 20 for M1 A1
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<p>8. (Volume of cuboid = <math>4 \times 5 \times 20 =</math>) <math>400 \text{ (cm}^3\text{)}</math></p> <p>(Volume of cube = <math>3 \times 3 \times 3 =</math>) <math>27 \text{ (cm}^3\text{)}</math></p> <p>(Number of cubes = ) <math>\frac{4 \times 5 \times 20}{3 \times 3 \times 3}</math> or equivalent</p> <p style="text-align: right;"><math>= 14.8(\dots)</math></p> <p>(Number of complete cubes = ) 14</p>	<p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p> <p>B1</p>	<p>Award B0 if 400 has come from incorrect working or if subsequent working is seen (e.g. finding the total surface area or <math>4 \times 5 \times 20 = 400</math>, <math>400 \times 2 = 800</math>).</p> <p>FT 'their 400' + 'their 27', provided 'their 27' <math>\neq 3</math> and that <b>B1 has previously been awarded</b> or <math>4 \times 5 \times 20</math> and <math>3 \times 3 \times 3</math> seen.</p> <p>May be implied in the final answer.</p> <p>FT only if truncation required.</p> <p>If <math>\frac{4 \times 5 \times 20}{3 \times 3 \times 3} = 14</math> (complete cubes) is seen, then award B1 B1 M1 A1 B1.</p>
<p>8. Organisation and Communication.</p> <p>Accuracy of writing.</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanation and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc</li> </ul>

17.(a)	$P(\text{Bus} = ) = 1 - 0.25 - 0.45$ $= 0.3$ AND shown on relevant branch.  0.96 shown on <u>all</u> three branches.	M1 A1  B1	Award M1A0 for 0.3 in working space and not on diagram.
17.(b)	$0.25 \times 0.04$ or equivalent $= 0.01$ or equivalent	M1 A1	CAO

<p>17. (Volume of cuboid = <math>4 \times 5 \times 20 \Rightarrow 400 \text{ (cm}^3\text{)}</math>)</p> <p>(Volume of cube = <math>3 \times 3 \times 3 \Rightarrow 27 \text{ (cm}^3\text{)}</math>)</p> <p>(Number of cubes = ) <math>\frac{4 \times 5 \times 20}{3 \times 3 \times 3}</math> or equivalent</p> <p style="text-align: right;">= <math>14.8(\dots)</math></p> <p>(Number of complete cubes = ) 14</p>	<p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p> <p>B1</p>	<p>Award B0 if 400 has come from incorrect working or if subsequent working is seen (e.g. finding the total surface area or <math>4 \times 5 \times 20 = 400</math>, <math>400 \times 2 = 800</math>).</p> <p>FT 'their 400' + 'their 27', provided 'their 27' <math>\neq 3</math> and that <b>B1 has previously been awarded</b> or <math>4 \times 5 \times 20</math> and <math>3 \times 3 \times 3</math> seen.</p> <p>May be implied in the final answer.</p> <p>FT only if truncation required.</p> <p>If <math>\frac{4 \times 5 \times 20}{3 \times 3 \times 3} = 14</math> (complete cubes) is seen, then award B1 B1 M1 A1 B1.</p>
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2.(a) 106000	B2	B1 for one of the following: <ul style="list-style-type: none"> <li>• sight of 53000</li> <li>• one hundred and six thousand</li> <li>• correctly doubling 'their 53 000' if it is first written in figures, provided 'their 53 000' is at least four figures and starts with the digits 5 and 3 (i.e. a place value error).</li> <li>• 106 followed by a minimum of two zeros</li> </ul>
2.(b) 3600	B1	
2.(c) 42	B1	
2.(d) 1000 OR 980 OR 1030	B2	B1 for $100 \times 10$ OR $100 \times 9.8$ OR $103 \times 10$
2.(e) No, with appropriate working e.g. <ul style="list-style-type: none"> <li>• <math>(626 \div 3 =) 208 \text{ r.}2</math></li> <li>• <math>(626 \div 3 =) 208.6(6\dots)</math></li> <li>• <math>6 + 2 + 6 = 14</math> AND 14 is not a multiple of 3</li> <li>• <math>3 \times 208 = 624</math> AND <math>3 \times 209 = 627</math></li> </ul>	B1	Allow No with $208.2$ Arithmetic seen must be correct and show a remainder of 2 or first decimal place.

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1.(b) 1944	B1	
2.(a) radius	B1	
2.(b) 1944	B1	

5.(a) 36	B1	<p>Allow B1 for a correct embedded answer (e.g. <math>36 \div 4 = 9</math> BUT B0 if contradicted by total <math>\neq 36</math>).</p> <p>Allow the sequence 9, 18, 27, 36 for B1, but only if no further numbers are shown.</p>																								
<p>5.(b) <b>Four</b> numbers including 11, 11 AND a pair of non-identical numbers whose sum is 14</p> <table border="1" data-bbox="331 398 587 593"> <tr><td>1</td><td>13</td><td>11</td><td>11</td></tr> <tr><td>2</td><td>12</td><td>11</td><td>11</td></tr> <tr><td>3</td><td>11</td><td>11</td><td>11</td></tr> <tr><td>4</td><td>10</td><td>11</td><td>11</td></tr> <tr><td>5</td><td>9</td><td>11</td><td>11</td></tr> <tr><td>6</td><td>8</td><td>11</td><td>11</td></tr> </table>	1	13	11	11	2	12	11	11	3	11	11	11	4	10	11	11	5	9	11	11	6	8	11	11	B2	<p>Numbers may be seen in any order. Accept answers using fractions, decimals or negative numbers.</p> <p>FT 11, 11 AND two numbers whose sum is 'their total' from (a) – 22 for a possible B2 or B1.</p> <p>Award B1 for <b>four</b> numbers with one of the following:</p> <ul style="list-style-type: none"> <li>• total = 36</li> <li>• total = 'their total' from 5(a)</li> <li>• four numbers with a unique mode of 11 (11, 11, ?, ? or 11, 11, 11, ? or 11, 11, 11, 11)</li> <li>• 7, 7, 11, 11.</li> </ul>
1	13	11	11																							
2	12	11	11																							
3	11	11	11																							
4	10	11	11																							
5	9	11	11																							
6	8	11	11																							

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10. (a)	3.5 pints	B1	
10.(b)	20 miles	B1	

<p>15. Identifying or implying that there are 16 possible correct combinations (e.g <math>2 \times 6</math>) or products (e.g. 12)</p> <p>Identifies <u>all</u> possible combinations (e.g <math>2 \times 6</math>) or products (e.g 12) that are a factor of 36  <math>1 \times 6 = 6</math>,    <math>1 \times 9 = 9</math>,    <math>2 \times 6 = 12</math>  <math>2 \times 9 = 18</math>,    <math>3 \times 6 = 18</math>,    <math>4 \times 9 = 36</math></p> <p>(Probability factor of 36 =) <math>\frac{6}{16}</math> or equivalent. ISW</p>	<p>B1</p> <p>B2</p> <p>B1</p>	<p>Award B1 for</p> <ul style="list-style-type: none"> <li>• simply stating 16</li> <li>• <math>(4 \times 4 =)16</math></li> <li>• <b>completed</b> sample space (need not be correct)</li> <li>• sight of <math>\frac{1}{4} \times \frac{1}{4}</math></li> <li>• sight of 16 in a denominator.</li> </ul> <p>FT 'their 16 possible correct products'. If products not used (e.g <math>2 + 6 = 8</math>), do not award B2 or B1.</p> <p>Award B2 for <b>clearly identifying</b> one of the following:</p> <ul style="list-style-type: none"> <li>• the <b>6</b> (and no more) combinations <math>1 \times 6</math>, <math>2 \times 9</math>, etc that form factors of 36 that can be achieved by the two spinners</li> <li>• the <b>6</b> (and no more) products of factors of 36 that can be achieved by the two spinners: 6, 9, 12, <b>18, 18</b>, 36</li> <li>• sight of <math>6 \times \frac{1}{4} \times \frac{1}{4}</math> or equivalent.</li> </ul> <p>Award B1 for <b>clearly identifying</b> one of the following:</p> <ul style="list-style-type: none"> <li>• at least 4 combinations that are factors of 36</li> <li>• at least 4 products of factors of 36 that can be achieved by the two spinners: 6, 9, 12, 18, 36</li> <li>• all of the factors of 36 (1,2,3,4,6,9,12,18,36).</li> </ul> <p>FT 'their list' only if at least 12 combinations or products given with <b>at least two factors of 36</b> that can be achieved by the two spinners <b>clearly identified</b>.</p> <p>Penalise, -1, any incorrect notation e.g. '6 out of 16'.</p> <p>Unsupported <math>\frac{6}{16}</math> or <math>\frac{3}{8}</math> or equivalent gains B1 B2 B1.</p>
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16.(a)	$1 - 0.3 - 0.1 - 0.25$ or equivalent $= 0.35$ or equivalent	M1 A1	The value in the table takes precedence. Award M1 for complete method.
16.(b)	24	B2	Award B2 for a final answer of 24 : 20 or 20 : 24.  Award B1 for one of the following: <ul style="list-style-type: none"><li>• <math>20 \div 0.25 \times 0.3</math></li><li>• <math>80 - (8 + 28 + 20)</math></li><li>• <math>25\% \rightarrow 20</math> <math>5\% \rightarrow 4</math> <math>30\% \rightarrow 20 + 4</math></li><li>• <math>0.3 \times 80</math> or <math>20 \times 1.2</math> or ...</li><li>• sight of 80</li><li>• other complete method</li><li>• unsupported 24 as a numerator in a fraction <math>&lt; 1</math>.</li></ul>

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4.(a)	unlikely	B1	
4.(b)	an even chance	B1	

Unit 1: Intermediate Tier	Mark	Comments
5.(a) A correct explanation given. e.g. '(equal) groups do not reach 20', '12 to 15 and 16 to 19 so no 20', 'to reach 20 the groups are not equal' 'it only goes up to 19' '20 not included'.	E1	Allow any unambiguous explanation.  Do not accept: 'because there's only 20 attempts'.  Award E1 if incorrect values are given in the table but correct explanation given.
5.(b) (0 to 6) 7 to 13 14 to 20	B1	Answer in table takes precedence.
5.(c)(i) $\frac{17}{100}$ or equivalent ISW	B1	B0 for incorrect notation e.g. '17 in 100', '17 out of 100', '17:100' etc.
5.(c)(ii) A correct explanation given e.g. 'the eleven competitors might have all scored 20', 'only one of them (might have) scored 19', 'we don't know how many competitors scored 19' 'the probability of scoring 18, 19 or 20 is $\frac{11}{100}$ ' 'the 11 could include (the scores of) 18 and 20' 'it doesn't tell you the exact score of all 11'	E1	Allow any unambiguous explanation.  E0 for mixing number of competitors and number of points scored. e.g. '11 points were scored for 18, 19, 20' '18, 19 or 20 people could have scored 11'.

<p>6.(a)</p> $1 - (0.54 + 0.12 + 0.25) \text{ or equivalent}$ $= 0.09 \text{ or equivalent}$	<p>M1</p> <p>A1</p>	<p>M1A1U1.</p> <p>Answer in table takes precedence.</p> <p>Award M1 for complete method. Note: <math>1 - 0.91</math></p> <p>Mark final answer.</p> <p>An unsupported answer of 0.09 or equivalent is awarded M1A1.</p>
<p>6.(b)</p> <p>2300 (balls)</p>	<p>B2</p>	<p>Mark final answer.</p> <p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> <li>• <math>575 \div 0.25</math></li> <li>• <math>575 \times 4</math></li> <li>• <math>575 \times 2 \times 2</math></li> <li>• <math>575 \div 25 \times 100</math></li> <li>• sight of 1242, 276, 575, 207 (separate colours)</li> <li>• sight of 1242, 276, 575, 2300 × 'their 0.09' evaluated correctly (separate colours)</li> <li>• <math>575 \times 3 + 575</math> (the number of non-blues + the number of blues)</li> <li>• other complete valid method</li> <li>• unsupported 2300 as a denominator in a fraction <math>&lt; 1</math>.</li> </ul> <p>An unsupported answer of 2300 (balls) is awarded B2.</p>

11.(a)	0.27 or equivalent.	B2	Mark final answer. Allow $\pm 0.27$ OR $(+)0.27$ 'and/or' $-0.27$ .  Award B1 for sight of one of the following: <ul style="list-style-type: none"><li>• 0.27 (or equivalent) followed by subsequent working</li><li>• <math>-0.27</math></li><li>• 0.0729.</li></ul>
11.(b)	8	B1	Answer line takes precedence. Allow embedded answer in working space provided not contradicted on answer line.
11.(c)	7	B1	Answer line takes precedence. Allow embedded answer in working space provided not contradicted on answer line.

Unit 2: Foundation Tier	Mark	Comments
14.(a)  $1 - (0.54 + 0.12 + 0.25)$ or equivalent  $= 0.09$ or equivalent	M1  A1	Answer in table takes precedence.  Award M1 for complete method. Note: $1 - 0.91$  Mark final answer.  Unsupported answer of 0.09 or equivalent is awarded M1A1.
14.(b)                      2300 (balls)	B2	Mark final answer.  Award B1 for one of the following: <ul style="list-style-type: none"> <li>• <math>575 \div 0.25</math></li> <li>• <math>575 \times 4</math></li> <li>• <math>575 \times 2 \times 2</math></li> <li>• <math>575 \div 25 \times 100</math></li> <li>• sight of 1242, 276, 575, 207 (separate colours)</li> <li>• sight of 1242, 276, 575, <math>2300 \times</math> 'their 0.09' evaluated correctly (separate colours)</li> <li>• <math>575 \times 3 + 575</math> (the number of non-blues + the number of blues)</li> <li>• other complete valid method</li> <li>• unsupported 2300 as a denominator in a fraction <math>&lt; 1</math>.</li> </ul> An unsupported answer of 2300 (balls) is awarded B2.
15. $51.3 = 2.3 + 9.8 (\times) t$ or equivalent  $49 = 9.8 (\times) t$ or equivalent  $t = 5$	M1  A1  A1	Implies M1.  FT only from $k = 9.8 (\times) t$ . Mark final answer.  Unsupported answer of 5 is awarded M1A1A1. $t = \frac{49}{9.8}$ is awarded M1A1A0.  If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction or decimal.  Allow M1A1A1 for a correct embedded answer BUT only M1A1A0 if contradicted by $t \neq 5$ .  If no marks, award either: <ul style="list-style-type: none"> <li>• SC2 for an answer of 5.469... or 5.47 (from <math>t = 53.6 \div 9.8</math>) <b>OR</b></li> <li>• SC1 for <math>53.6 = 9.8 (\times) t</math>.</li> </ul>

<p>15.(a)</p> <p style="text-align: center;"><math>\frac{5}{8}</math> on 'Bus B' branch.</p> <p><math>\frac{1}{2}</math> or <math>\frac{4}{8}</math> or 0.5 on all 'seat branches'</p>	<p>B1</p> <p>B1</p>	<p>Numerator and denominator must be integers.</p> <p>Allow any equivalent to <math>\frac{5}{8}</math> e.g. 0.625. Do not allow 0.63.</p> <p>Allow any equivalent to <math>\frac{1}{2}</math>.</p>
<p>15.(b)</p> <p><math>\frac{5}{8} \times \frac{1}{2}</math> or equivalent</p> <p><math>= \frac{5}{16}</math> or <math>\frac{20}{64}</math> or <math>\frac{25}{80}</math> or equivalent ISW</p>	<p>M1</p> <p>A1</p>	<p>FT 'their <math>\frac{5}{8}</math>' × 'their <math>\frac{1}{2}</math>', provided both values &lt; 1.</p> <p>Do not allow rounded or truncated answers if decimal given. Numerator and denominator must be integers.</p>

16.(a)	A correct explanation given. e.g. '(equal) groups do not reach 20', '12 to 15 and 16 to 19 so no 20', 'to reach 20 the groups are not equal' 'it only goes up to 19' '20 not included'.	E1	Allow any unambiguous explanation.  Do not accept: 'because there's only 20 attempts'.  Award E1 if incorrect values are given in the table but correct explanation given.
16.(b)	(0 to 6)    7 to 13    14 to 20	B1	Answer in table takes precedence.
16.(c)(i)	$\frac{17}{100}$ or equivalent    ISW	B1	B0 for incorrect notation e.g. '17 in 100', '17 out of 100', '17:100' etc.
16.(c)(ii)	A correct explanation given e.g. 'the eleven competitors might have all scored 20', 'only one of them (might have) scored 19', 'we don't know how many competitors scored 19' 'the probability of scoring 18, 19 or 20 is $\frac{11}{100}$ '  'the 11 could include (the scores of) 18 and 20' 'it doesn't tell you the exact score of all 11 competitors'	E1	Allow any unambiguous explanation.  E0 for mixing number of competitors and number of points scored. e.g. '11 points were scored for 18, 19, 20' '18, 19 or 20 people could have scored 11'.
17.(a)	$\frac{96}{300} (\times 100)$ or equivalent  = 32(%)	M1  A1	M1 for sight of 0.32.  Note: other complete valid methods to look out for include: <ul style="list-style-type: none"> <li>• <math>96 \div 3</math></li> <li>• <math>10\% + 10\% + 10\% + 1\% + 1\%</math> (= <math>30 + 30 + 30 + 3 + 3</math>)</li> <li>• (96 out of 300 =) 32 out of 100 = 32(%)</li> </ul>

<p>2(a)</p> <p>(Amount of discount for 1 ticket =) (£)0.45 or 45(p) OR (Amount of discount for 2 tickets =) (£)0.9(0) or 90(p)</p> <p>(Cost of tickets =) <math>2 \times (£)4.50 - 2 \times (£)0.45 + (£)1.40</math> <math>(9 - 0.90 + 1.40)</math></p> <p>Or <math>2 \times (£)4.50 - 2 \times 0.1 \times (£)4.50 + (£)1.40</math></p> <p>Or equivalent</p> <p style="text-align: right;">= (£)9.50</p>	<p>B1</p> <p>M2</p> <p>A1</p>	<p>If units are given, they must be correct Workings may be seen in stages</p> <p>Award B1 for (£)0.9(0) or 90(p) seen as the <b>total discount</b></p> <p>FT 'their <b>derived or stated</b> (£)0.45 or (£)0.9(0)'</p> <p>Award M1 for:</p> <ul style="list-style-type: none"> <li>• <math>2 \times (£)4.50 - 2 \times (£)0.45</math> (£9 – 90p)</li> <li>• <math>2 \times (£)4.50 - 1 \times (£)0.45 + (£)1.40</math> (£9 – 45p + £1.40)</li> <li>• <math>1 \times (£)4.50 - 2 \times (£)0.45 + (£)1.40</math> (£4.50 – 90p + £1.40)</li> <li>• <math>1 \times (£)4.50 - 1 \times (£)0.45 + (£)1.40</math> (£4.50 – 45p + £1.40)</li> <li>• <math>2 \times (£)4.50 - 2 \times (£)0.45 + 2 \times (£)1.40</math> (£9 – 90p + £2.80)</li> <li>• <math>2 \times (£)4.50 + (£)1.40</math> (£)9 + (£)1.40</li> </ul> <p>A1 FT from M2 or M1 (Answers from M1: (£)8.10, (£)9.95, (£)5, (£)5.45 (£)10.90, (£)10.40)</p> <p><u>If the discount is applied at the end:</u> Award M1 for <math>2 \times £4.50 + £1.40</math> Award A1 for £10.40 Award SC1 for an answer of £9.36 (from <math>£10.40 - 0.1 \times £10.40 = £10.40 - £1.04</math>) FT for SC1 for <math>0.9 \times</math> 'their 10.40' correctly evaluated provided M1 awarded</p> <p><u>If the booking fee is added to the cost of each ticket and the discount is applied at the end:</u> Award M1 for: <math>2 \times (£4.50 + £1.40) - 0.1 \times (£4.50 + £1.40)</math> Or £11.80 - £1.18 Award A1 for £10.62</p> <p>If no marks awarded, award SC1 for (£)9 seen</p>
<p>Organisation and communication</p> <p>Writing</p>	<p>OC1</p> <p>W1</p>	<p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanations and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc.</li> </ul>



5.(a)	$\frac{1}{7}$	B1	
5.(b)(i)	$\frac{2}{7}$	B1	

5.(b)(ii)

$$\frac{2}{7} \times 91$$

26

M1

May be seen in stages.

FT 'their (b)(i)'.

A1

Allow '26 out of 91' for M1A1.

Award M1A0 for a final answer of  $\frac{26}{91}$ .


Allow truncated or rounded answers if following through 'their (b)(i)'.

Note:

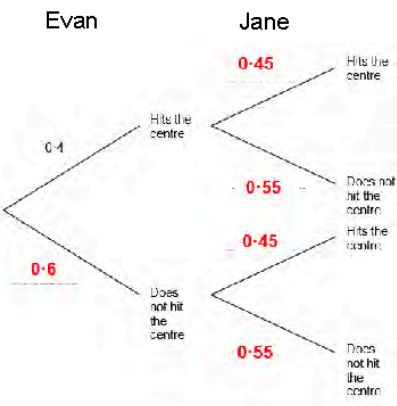
$\frac{2}{5} \times 91 =$	36.4 or 36 or 37
$\frac{1}{7} \times 91 =$	13
$\frac{4}{7} \times 91 =$	52
$\frac{4}{5} \times 91 =$	72.8 or 72 or 73

7.(a) $\frac{1}{2}$ or $\frac{180}{360}$ or 50% or equivalent	B1	ISW Allow (a) half BO for answer using words alone with no numerical value; e.g. 'even chance' alone.
7.(b) $2 \times 45$ 90	M1 A1	FT from $45 \div$ 'their (a)'
7.(c) $\frac{60}{360}$ or $\frac{1}{6}$ or $\frac{15}{90}$ or equivalent	B2	ISW B1 for sight of $360^\circ$ as a denominator.

7.	5 (more yellow counters)	B2	Answer line takes precedence. Award B1 for sight of one of the following: <ul style="list-style-type: none"><li>• <math>\frac{6}{8}</math> but not <math>\frac{3}{4}</math></li><li>• 6 yellow counters as a final answer</li><li>• 8 counters in total</li><li>• evidence of trialling e.g. sight of at least two of <math>\frac{2}{4}, \frac{3}{5}, \frac{4}{6}, \frac{5}{7}, \dots</math></li></ul>
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10. 	B1 B1	C between 0.65 and 0.75 <b>exclusive</b> P between 0.25 and 0.35 <b>exclusive</b>
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14.(a)	$\frac{1}{7}$	B1									
14.(b)(i)	$\frac{2}{7}$	B1									
14.(b)(ii)	$\frac{2}{7} \times 91$  26	M1  A1	<p>May be seen in stages. FT 'their (b)(i)'.</p> <p>Allow '26 out of 91' for M1A1. Award M1A0 for a final answer of <math>\frac{26}{91}</math>. Allow truncated or rounded answers if following through 'their (b)(i)'.</p> <p>Note:</p> <table border="1"> <tr> <td><math>\frac{2}{5} \times 91 =</math></td> <td>36.4 or 36 or 37</td> </tr> <tr> <td><math>\frac{1}{7} \times 91 =</math></td> <td>13</td> </tr> <tr> <td><math>\frac{4}{7} \times 91 =</math></td> <td>52</td> </tr> <tr> <td><math>\frac{4}{5} \times 91 =</math></td> <td>72.8 or 72 or 73</td> </tr> </table>	$\frac{2}{5} \times 91 =$	36.4 or 36 or 37	$\frac{1}{7} \times 91 =$	13	$\frac{4}{7} \times 91 =$	52	$\frac{4}{5} \times 91 =$	72.8 or 72 or 73
$\frac{2}{5} \times 91 =$	36.4 or 36 or 37										
$\frac{1}{7} \times 91 =$	13										
$\frac{4}{7} \times 91 =$	52										
$\frac{4}{5} \times 91 =$	72.8 or 72 or 73										

<p>15.(a) 0.6 or equivalent on correct Evan branch.</p> <p>0.45 and 0.55 or equivalent correctly shown on both pairs for Jane.</p> 	<p>B1</p> <p>B2</p>	<p>Award B1 for one of the following:</p> <ul style="list-style-type: none"> <li>• 0.45 and 0.55 or equivalent correctly shown on one pair of Jane's branches only</li> <li>• 0.45 and 0.55 or equivalent consistently reversed on all Jane branches.</li> </ul>
<p>15.(b)     0.4 × 0.45 or equivalent</p> <p style="text-align: right;">0.18 or equivalent ISW</p>	<p>M1</p> <p>A1</p>	<p>FT 0.4 × 'Jane's probability of hitting the centre' provided less than 1.</p>

<p>15.(a)</p> $3y = 24 \quad \text{or} \quad y = 24/3$ $y = 8$	<p>B1 B1</p>	<p>FT from <math>3y = k</math>. Mark final answer. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction or a decimal rounded or truncated to at least 1 decimal place.</p> <p>Unsupported answer of 8 is awarded B1 B1.</p> <p>Allow an embedded answer but penalise -1 if contradicted by <math>y \neq 8</math>.</p>
<p>15.(b)</p> $8p - 3p = -25 - 5 \quad \text{OR} \quad 5 + 25 = 3p - 8p$ $5p = -30 \quad \text{OR} \quad 30 = -5p$ $p = -6$	<p>B1  B1  B1</p>	<p>FT until 2<sup>nd</sup> error.</p> <p>Mark final answer. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction or a decimal rounded or truncated to at least 1 decimal place.</p> <p>Unsupported answer of -6 is awarded B1 B1 B1.</p> <p>Allow an embedded answer but penalise -1 if contradicted by <math>p \neq -6</math> or equivalent.</p>

16.	5 (more yellow counters)	B2	<p>Answer line takes precedence. Award B1 for sight of one of the following:</p> <ul style="list-style-type: none"><li>• <math>\frac{6}{8}</math> but not <math>\frac{3}{4}</math></li><li>• 6 yellow counters as a final answer</li><li>• 8 counters in total</li><li>• evidence of trialling e.g. sight of at least two of <math>\frac{2}{4}, \frac{3}{5}, \frac{4}{6}, \frac{5}{7}, \dots</math></li></ul>
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<p>16.(a) Sight of 0.032 or equivalent e.g. 3.2% or <math>\frac{160}{5000}</math></p> <p>Explanation e.g. 'all data used', 'last point plotted', 'the number of batteries checked was the highest'.</p>	B1	Answer line takes precedence. ISW. Allow incorrect probability notation e.g. 160 out of 5000.
	E1	Accept any indication that the final reading should give the best estimate.  Allow 'the more times you repeat an action, the more accurate the estimate is'.

16.(b)

$$3000 \times 0.033 \times 0.026 \quad \text{or} \quad 3000 \times 0.033 \times 2.6$$

(£)2.57(4) or 257(.4)(p) ISW

M2

May be done in any order.

May be seen in stages or implied in later working. Award M1 for sight of one of the following, allowing one place value error in 0.033 or 0.026 (may be embedded):

- $3000 \times 0.033$
- 99
- $3000 \times (\text{£})0.026$
- $3000 \times 2.6(\text{p})$
- (£)78 or 7800(p)
- $0.026 \times 0.033$
- $2.6 \times 0.033$
- 0.000858
- 0.0858.

Award M1 for sight of the consecutive digits 99 or 78 or 858 in a number involving a place value error e.g. 990 but not 8990.

A1

CAO.

Allow (£)2.58 or 258(p) (If units are given they must be correct).

Incorrect units may imply M2 A0.

Award M1 A0 for one of the following answers:

Answer	From
2(. )34	$(3000 \times 0.026 \times 0.03)$
2(. )10(6) or 2(. )11	$(3000 \times 0.026 \times 0.027)$
2(. )62(2)	$(3000 \times 0.026 \times 0.029)$
2(. )49(6) or 2(. )50	$(3000 \times 0.026 \times 0.032)$

End of solutions