

Question			Answer	Marks	Part marks and guidance	
1	(a)		11[.0]	1		
1	(b)		[£]4.23	1		Condone [£]4.23p
2	(a)		-11	1		
2	(b)		-7	1		
2	(c)		16	1		
3	(a)		Correct reflection	2	B1 for a correct reflection in any vertical line	Use overlay as a guide, mark intention, allow freehand. Reflection must be on the grid given
3	(b)		Correct rotation	2	B1 for correct rotation 180° or 90° or clockwise about P or 90° anticlockwise by another point	Use overlay as a guide, mark intention, allow freehand. Mark to Candidates advantage Rotation must be on the grid given Red Overlays have to be correct for B1 Green Overlay shows correct answer for 2 marks, but can be moved around the grid to check for B1 .
4			6	1		
5	(a)		$\frac{1}{8}$	1		Maybe seen on the diagram Accept equivalent fractions
5	(b)		Arrow at $\frac{7}{8}$	1		Accept any clear intention of identification of $\frac{7}{8}$

Question			Answer	Marks	Part marks and guidance	
6			180	2	M1 for 15×12 oe If 0 scored, SC1 for 180000[ml]	Repeated addition, we must see their method, allow one arithmetic error. e.g. 15, 30, 45, 60, 75, 90 then 90×2 [=180]
7	(a)		$\frac{3}{5}$	2	B1 for $\frac{60}{100}$ oe	
7	(b)		$3\frac{2}{5}$	1		
8			= < <	3	B1 for each	
9	(a)		$\frac{3}{16}$	2	M1 for $\frac{4}{16}$ or $\frac{7k}{16k} - \frac{4k}{16k}$ or $\frac{3k}{16k}$	e.g. $\frac{28}{64} - \frac{16}{64}$
9	(b)		$\frac{3}{4}$	3	B2 for $\frac{45}{60}$ oe fraction or $\frac{1}{4} \times \frac{3}{1}$ or M1 for $\frac{5}{12} \times \frac{9}{5}$ or $\frac{1}{\frac{12}{9}}$ or $\frac{1}{\frac{4}{3}}$ If 0 scored, award SC1 for converting the fractions to a common denominator	isw attempts to convert after correct answer seen e.g. 0.75 $\frac{15k}{36k} \div \frac{20k}{36k}$ e.g. $\frac{15}{36} \div \frac{20}{36}$ or $\frac{15}{36}$ and $\frac{20}{36}$
10	(a)		$2y + 11x$	2	B1 for $2y$ or $11x$ in final answer	Accept $11x + 2y$ for 2 marks Do not accept $-2y$ or $-11x$
10	(b)		$30ab$ or $30ba$	1		Not e.g. $30xab$, $a30b$, $b30a$, $ab30$

Question			Answer	Marks	Part marks and guidance	
11			Cuboid Cone [Triangular] Prism	3	B1 for each	Mark intention, allow name to be in any 'box' associated with that line For cuboid accept 'Rectangular Prism' For Cone accept ' <u>Circular based pyramid</u> '
12	(a)		7	1		
12	(b)		8	1		
13	(a)		15	1		
13	(b)		3 27	2	B1 for each in correct place	
14			10 nfww	3	M2 for $6^2 + 2 \times 4 \times 8$ oe or M1 for $[u^2 =] 6^2$ or $[2as =] 2 \times 4 \times 8$	Accept answer -10 or ± 10 M2 implied by $[v^2 =] 100$ or $\sqrt{100}$ M1 implied by $[u^2 =] 36$ or $[2as =] 64$
15	(a)		5	2	M1 for 6×7.5 oe	M1 implied by 45 Repeated addition, we must see their method, allow one arithmetic error. e.g. 7.5, 15 then $15 \times 3 [=45]$

Question			Answer	Marks	Part marks and guidance	
	(b)		12	3	<p>B2 for 12.5</p> <p>or</p> <p>M2 for $their(a) \times 1000 \div 400$ or $their(a) \div [0].4$</p> <p>or</p> <p>M1 for $their(a) \times 1000$ or $400 \div 1000$ or $their(a) \div \text{figs } 4$</p>	<p><i>their(a)</i> must be > 0.4</p> <p>M2 implied by repeated addition or subtraction to one less than <i>their(a)</i> or <i>their(a)</i> $\times 1000$ see appendix If <i>their(a)</i> < 1.2 then all multiples must be seen</p>
	(c)		200	2	<p>B2FT for $their(a) \times 1000 - their(b) \times 400$ evaluated correctly</p> <p>or</p> <p>M1 $their(a) \times 1000 - their(b) \times 400$</p>	<p><i>their(a)</i> must be > 0.4</p> <p>$their(a) \times 1000 \geq their(b) \times 400$ <i>their(b)</i> must be an integer.</p> <p>Implied by repeated subtraction or addition. Working may be seen in part (b) for M1</p>

16	(a)		Three of 20[.00], 30[.00], 40 and 4 seen 40 × 20 4 × 30 920 or 800 and 120	B1 M1 for <i>their</i> 40 x <i>their</i> 20 M1 for <i>their</i> 4 x <i>their</i> 30 A2 A2 dep on B1M1M1 or A1 dep on B1M1 for 800 or 120	B1 seen as rounding <i>their</i> 40 can be $40\frac{1}{3}$, $40.\dot{3}$, 40.33[3...] or 41 <i>their</i> 20 can be 20.15 or 21 <i>their</i> 4 can be $4\frac{1}{4}$, 4.25 or 5 <i>their</i> 30 can be 30.23 or 31																									
16	(b)		The calculation is an underestimate	1	All values were rounded down oe Mark best response as long as not contradictory or incorrect <u>See Appendix 1</u>																									
17			40	2	M1 for $120 \div 3$ Accept $1200 \div 30$, $\frac{600}{15}$, $\frac{120}{100} \div \frac{3}{100}$ Do not allow M1 if extra step after $120 \div 3$ e.g. $120 \div 3$ then divide by 100																									
18	(a)		<div>First card</div> <table><tr><td>Difference</td><td>0</td><td>2</td><td>5</td><td>9</td></tr><tr><td>0</td><td></td><td>2</td><td>5</td><td>9</td></tr><tr><td>2</td><td>2</td><td></td><td>3</td><td>7</td></tr><tr><td>5</td><td>5</td><td>3</td><td></td><td>4</td></tr><tr><td>9</td><td>9</td><td>7</td><td>4</td><td></td></tr></table> <div>Second card</div>	Difference	0	2	5	9	0		2	5	9	2	2		3	7	5	5	3		4	9	9	7	4		2	B1 for 3 or 4 correct entries For 2 marks, ignore entries in shaded squares if they are 0's For B1 ignore shaded squares
Difference	0	2	5	9																										
0		2	5	9																										
2	2		3	7																										
5	5	3		4																										
9	9	7	4																											

18	(b)		$\frac{6}{12}$ oe nfww	2	<p>If shaded squares are blank or all have zeros FT <i>their</i> 12 entries for 2 marks</p> <p>M1 for all <i>their</i> even numbers and all factors of 10 identified only</p> <p><u>IF Shaded SQUARES are counted:</u> FT <i>their</i> 16 entries</p> <p>B2FT <i>their</i> table Or M1 for all <i>their</i> even numbers and all factors of 10 identified only</p> <p>If 0 scored SC1 for answer $\frac{6}{16}$</p>	<p>isw conversion/cancelling after <i>their</i> correct probability Do not accept ratio or words If table correct and shaded squares have zeros allow answer $\frac{10}{16}$ oe for 2 marks</p> <p>M1 may be seen on table by e.g. ringing values or listing</p> <p>We only accept the 16 squares in the Grid, not the card values</p> <p>Count zero as an even number</p> <p>If table correct apart from all zeros in shaded squares allow all even numbers and factors of 10 [0's in shaded squares] identified</p> <p>For SC1 allow answer $\frac{3}{8}$ if $\frac{6}{16}$ seen first</p>
19			Correct ruled line with two pairs of correct arcs	2	<p>B1 for correct ruled line with no or wrong arcs, or correct intersecting arcs but no line or correct dashed/dotted line with correct arcs</p>	<p>Use protractor to measure, allow 88°-92° Use Ruler to measure, allow 35-39mm from A or B</p> <p>Arcs may be two continuous arcs centred at A and B with two intersections</p>
20	(a)		$\begin{pmatrix} 2 \\ -3 \end{pmatrix}$	2	<p>B1 for answer $\begin{pmatrix} 2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -3 \end{pmatrix}$</p>	<p>For B1 allow $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$</p> <p>B0 for incorrect numbers with vinculum/fraction line.</p>

20	(b)		-a	1		
21	(a)		12 26 with correct working	6	<p>B5 for 3 hours 36 mins with correct working or 12 26am with correct working</p> <p>OR</p> <p><u>Method to find time in 1st stage</u></p> <p>M2 for $\frac{1}{10} \times 200 \div 40$ [$\times 60$] oe or M1 for $\frac{1}{10} \times 200$ oe</p> <p>AND</p> <p><u>Method to find time in 2nd stage</u></p> <p>M2 for $0.4 \times 200 \div 50$ oe</p> <p>or M1 for 0.4×200 oe</p> <p>AND</p> <p>M1dep on M2M2 for <i>their</i> 30[mins] + <i>their</i> 96[mins] + 1hr30[mins]</p> <p>If 0 or 1 or 2 scored, instead award SC3 for answer 12 26 or 12 26pm If 0 or 1 scored, instead award SC2 for 3h 36 [mins] or 12 26 am</p>	<p><u>Correct working requires evidence of at least M2M2</u> Accept 12 26pm for 6 marks</p> <p>M2 implied by 0.5[h], $\frac{1}{2}$ [h] or 30 [mins] nfw</p> <p>M1 implied by 20 [miles] nfw</p> <p>M2 implied by $\frac{8}{5}$ [h], $1\frac{3}{5}$ [h], 1.6 [h] isw, 96[mins] or 1[h] 36[min] nfw</p> <p>M1 implied by 80 [miles] nfw</p> <p>M1 implied by addition onto 0850</p>

21	(b)		Correct response e.g. Ryan drives at the speed limit and does not drive slower or is delayed	1		Accept any valid reason why Ryan may not be able to travel at Maximum Speed at all times e.g. Ryan does not get stuck in traffic There are no roadworks etc He does not stop on the journey Car does not breakdown Do not accept incorrect statements e.g he travels at a constant speed Mark best response as long as not contradictory or incorrect <u>See Appendix 2</u>
22	(a)		Positive	1		Ignore embellishments
22	(b)		Indicates the point (39, 10)	1		Ignore circles around the points ≤ 30 for both Science and Maths as this working is for part (e)
22	(c)		Ruled line of best fit and answer FT ± 0.5 <i>their</i> straight ruled line at 28 Science marks	2	B1 for ruled line of best fit or answer FT ± 0.5 <i>their</i> straight ruled line with positive gradient	Use overlay for LOBF, ruled line needs to reach both gates set at: (8,11) and (8,22) (49,35) and (49,46) Gates include circles on overlay Ignore LOBF beyond gates

22	(d)		<p>Correct explanation e.g. It is beyond the range of the data provided on the scatter diagram.</p> <p>The pupil may not follow the trend/pattern of the data</p>	1		<p><u>Accept</u> The line of best fit should not extend beyond the data provided Outside range of data provided oe Small sample Data only goes up to 49 No one scores 60</p> <p><u>Do not Accept</u> You cannot extend past the LOBF otherwise it is inaccurate</p> <p>Ignore incorrect statements <u>See Appendix 3</u></p>
22	(e)		35[%]	3	<p>M2 for $\frac{7}{20} \times 100$ oe or B1 for 7 [pupils]</p> <p>If 0 scored, SC1 for $\frac{\text{their}7}{20}$ correctly converted to a percentage.</p>	<p>B1 implied by $\frac{7}{20}$ oe or $\frac{7}{k}$ ($k > 7$)</p>
23			8	4	<p>M2 for $a + a + a + 5 + a + 5 = 42$ oe or M1 for 3×14 oe or $a + a + a + 5 + a + 5$ oe</p> <p>AND</p> <p>M1 for $a = \frac{42-10}{4}$ oe or FT <i>their</i> equation of the form $ka + c = d$ oe to $a = \frac{d-c}{k}$ oe</p>	<p>Allow M2 if correct expression seen first and then incorrectly simplified before equation = 42</p> <p>M1 implied by 42 or $4a + 10$ oe</p> <p>FT only from written equation Where k, c and d are positive integers and $k > 1$ Allow M1 for one trial into $2(a + 5) + 2a$ evaluated correctly</p>

24		<p>1200 \times 1.05 oe or 1200 \times 0.05 oe</p> <p>1260 or 60 or 1.1025</p> <p>1260 \times 1.05 oe or 1260 \times 0.05 oe or 60 \times 1.05 oe or 60 \times 0.05 oe</p> <p>60 and 63 or 1323</p>	<p>M1</p> <p>B1</p> <p>M1FT</p> <p>A1</p>	<p>M1FT for <i>their</i> 1260 \times 1.05 oe or <i>their</i> 1260 \times 0.05 oe or <i>their</i> 60 \times 1.05 oe or <i>their</i> 60 \times 0.05 oe</p> <p>A1 dep M1B1M1</p>	<p>e.g. 10% = 120, 5% = 60 We do not allow mis-reads in this question</p> <p>M1M1 implied by 1200 \times 1.05² oe M1FT implied by 1323 or 63 or 3</p> <p>For method we do not accept e.g. 105% \times 1200 or 5% of 1200</p>
25		<p>Correct reason given e.g. Her sample may not be representative oe</p> <p>Her sample is too small oe</p>	<p>1</p>		<p>She should do the test more than 10 times She should do the test e.g. 100/1000 times.</p> <p>Mark best response as long as not contradictory or incorrect</p> <p><u>See Appendix 4</u></p>

26			$\frac{23}{50}$ oe with correct working	5	<p> M1 for $50 - 10 - 1$ M1 for <i>their</i> $39 \div (2 + 1)$ A1 for 13 or 26 AND B1 for answer $\frac{23}{k}$ or answer $\frac{p}{50}$ If 0 or 1 scored, instead award SC2 for answer of $\frac{23}{50}$ oe </p>	<p> <u>Correct working requires evidence of at least M1M1A1</u> isw conversion/cancelling after correct answer seen Do not accept ratio or words All method marks may be seen on Diagram M1 implied by 39 M1 implied by 13 Repeated addition/subtraction see appendix 26:13 or 13:26 implies M1M1A1 Where $k > 23$ and an integer Where $p < 50$ and a positive integer Algebraic method see Appendix 5 </p>
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27	(a)		$(x - 2)(x + 7)$ $x^2 - 2x + 7x - 14$ or better $x^2 + 5x - 14 = 70$ or $x^2 - 2x + 7x - 14 = 70$	B1 M2 A1	 M1 for 3 out of 4 terms correct A1 dep on B1M2 With no errors leading to the answer	B1 implied by $(x - 2)$ and $(x + 7)$ in a multiplication grid Condone missing final bracket e.g. $(x - 2)(x + 7$ $+5x$ is two terms <u>A1 alternatives:</u> $x^2 + 5x - 14 - 70 = 0$ or $x^2 - 2x + 7x - 14 - 70 = 0$
27	(b)	(i)	$(x + 12)(x - 7) [= 0]$ -12 and 7	M2 B1FT	M1 for $(x + a)(x + b)$ where $ab = -84$ or $a + b = 5$ or $x(x + 12) - 7(x + 12)$ or $x(x - 7) + 12(x - 7)$ correct or FT <i>their</i> linear factors	Condone $(x + 12)(x - 7) = y$ for 2 marks For M2 and M1 condone the omission of the final bracket. $(x - 12)(x + 7)$ then -12 and 7 scores M1B0 If both correct after $x(x + 12) - 7(x + 12)$ or $x(x - 7) + 12(x - 7)$ allow M2B1 BOD
27	(b)	(ii)	14	1	FT dep on 2 integer answers given in part (b)(i) <i>their</i> largest positive answer + 7	