

Question		Answer	Marks	Part marks and guidance	
1	(a)	25	1		
1	(b)	Any 4 sections indicated	1		Mark clear intention
2	(a)	12	1		
2	(b)	$2 + (7 - 3) \times 8 = 34$	1		Condone additional bracket(s) as long as mathematically correct.
3	(a)	45	2	M1 for at least two of 24, 12 and 9 or for attempt to sum <i>their</i> three values	May be seen on bar chart <i>their</i> three values MUST be stated
3	(b)	$1\frac{1}{2}$ squares drawn Key: 6	1 1		Mark intention to draw half a square in any orientation. Allow for internal line of picture to be omitted.
4	(a)	2	1		
4	(b)	$\frac{9}{4}$	1		Accept equivalent improper fractions.
4	(c)	$\frac{3}{14}$ oe	2	M1 for $\frac{8}{14}$ or $\frac{8k}{14k} - \frac{5k}{14k}$	e.g. $\frac{56}{98} - \frac{35}{98}$ isw attempts to convert after correct answer seen
4	(d)	$\frac{3}{8}$ final answer	2	M1 for $\frac{30}{80}$ or equivalent fraction or for correct cancelling of 2 and 16 and 5 and 15	i.e. $\frac{1}{1} \times \frac{3}{8}$
5	(a)	18	1		

Question		Answer	Marks	Part marks and guidance	
5	(b)	-7	1		
6	(a)	39	2	B1 for answer 0.39 or M1 for $134 - 95$ or $1.34 - 0.95$	For M1 allow embedded calculations, e.g. $95 + 39 = 134$
6	(b)	$0.199 [l]$, $\frac{1}{5} [l]$, $250 [ml]$, $0.3 [l]$	2	B1 for 3 values in correct order or for 0.25 and 0.2 or for 200, 300 and 199	For 2 marks accept correct equivalents [with correct units stated] Use “cover up” method
7	(a)	14	2	M1 for $\frac{700 \times 2}{100}$ oe	Answer 714 implies M1
7	(b)	742	2	M1 for $700 + 3 \times 14$ oe or for $700 + 3 \times \text{their (a)}$ oe	FT for 2 marks when <i>their (a)</i> is < 700
8		230	3	M2 for $200 \times \frac{100+15}{100}$ oe or M1 for $200 \times \frac{15}{100}$ oe	M1 implied by 30
9	(a)	70	2	M1 for $[AB=] 6.8 [cm]$ to $7.2 [cm]$ or for <i>their</i> written AB in $cm \times 10$	For 2 marks accept answers in the range 68 to 72 AB must be stated. Method may be seen on the diagram.
9	(b)	Town C marked 5.3 to 5.7 cm from B and on a bearing of 328° to 332°	2	M1 for either length or bearing correct If 0 scored SC1 for correct point from A	Allow unambiguous indication if a cross is not seen.

Question		Answer	Marks	Part marks and guidance	
10		32	4	<p>M1 for 9×30 implied by 270</p> <p>M1 for <i>their</i> $270 + 50$ Implied by 320</p> <p>M1 for <i>their</i> total earnings $\div 10$ (could be implied by their answer)</p>	<p><u>Alternative Method:</u></p> <p>M1 for 9×30 implied by 270 M1 for $50 \div 10$ and <i>their</i> $270 \div 10$ M1 for $27 + 5$</p> <p>see appendix</p>
11		1	3	<p>B1 for $[\sqrt[3]{64} =] 4$</p> <p>B1 for $[(\frac{1}{2})^2 =] \frac{1}{4}$ oe</p>	<p>$\frac{4}{4}$ scores B1B1</p>
12	(a)	9 3 2 7 9 3 7 2 9 7 3 2 9 7 2 3 9 2 3 7 9 2 7 3	2	<p>B1 for at least 5 out of 6 correct with maximum 1 repeat/extra or for 4 out of 6 correct (no repeats/extras)</p>	<p>If 9 3 2 7 is omitted allow 2 marks for 5 correct or B1 for at least 4 out of 5 correct with maximum 1 repeat/extra or for 3 out of 5 correct (no repeats/extras)</p>
12	(b)	$\frac{2}{6}$ oe	1	FT <i>their</i> (a)	<p>Mark to candidate's advantage. Allow for FT either their total written combinations or their combinations including the given combination. Allow 0.33 [3....] or 33.[3....]%</p> <p>Do not accept ratio or words</p> <p>isw attempts to convert to decimals or percentages when acceptable fraction seen</p>

Question			Answer	Marks	Part marks and guidance	
13	(a)		No and 83 oe or No and 49 and 46 or No and 25 and 28	4	<p>M3 for $3 + 6 + 10 + 15 + \textit{their 21} + \textit{their 28}$ or for $\textit{their 21} + \textit{their 28}$ and $80 - \textit{their 34}$ or for $80 - (\textit{their 21} + 15 + 10 + 6 + 3)$ and $\textit{their 28}$</p> <p>or</p> <p>B2 for 21 and 28 or B1 for 21 or 28</p> <p>OR</p> <p>M2 for $80 - (\textit{their 21} + 15 + 10 + 6 + 3)$ or $80 - \textit{their 34}$ or M1 for $[80 -] 3 + 6 + 10 + 15$</p>	<p>implied by 83 implied by 49 and 46 implied by 25 and 28</p> <p>$\textit{their 21} > 15$ and $\textit{their 28} > \textit{their 21}$</p> <p>B2 implied by 49</p> <p>M2 implied by 25 or 46 M1 implied by 34</p>
13	(b)	(i)	10 + 15 and 25	1		
13	(b)	(ii)	10	2	<p>M1 for recognition of square number pattern</p> <p>If 0 scored SC1 for answer 11</p>	<p>e.g. $\sqrt{144}$, 11×11, 36, 49, [64, ...]</p>

Question		Answer	Marks	Part marks and guidance	
14	(a)	4 [badges] with correct working	5	<p>M3 for $50 - (6 \times 3.50 + 2 \times 7.50)$ oe or M2 for $6 \times 3.50 + 2 \times 7.50$ oe or M1 for 6×3.50 or 2×7.50 oe</p> <p>AND</p> <p>M1 for <i>their</i> $(50 - (6 \times 3.50 + 2 \times 7.50)) \div 2.99$ oe</p> <p>If 0 or 1 scored, instead award SC2 for 4 [badges] with no or insufficient working or If 0 scored SC1 for 14 with no or insufficient working</p>	<p>'Correct working' requires full evidence of at least M2M1</p> <p>M3 implied by 14,15,21 seen or 14,36 seen M2 implied by 36 M1 implied by 21 or 15</p> <p>Accept <i>their</i> $(50 - 6 \times 3.50 + 2 \times 7.50) \div 3$</p> <p>Implied by list 2.99, 5.98, 8.97, 11.96, [14.95,] up to one less than <i>their</i> 14 Condone one arithmetic slip. or 3,6,9,12, [15,] up to one less than <i>their</i> 14 or Embedded e.g. $4 \times 2.99 = 11.96$</p>
	(b)	2.04	2	<p>M1 for <i>their</i> $14 - \text{their } ((a) \times 2.99)$ oe</p>	<p><i>their</i> $((a) \times 2.99)$ could be seen in part (a) and must be $<$ <i>their</i> 14</p> <p>M1 can be implied by a correct FT answer to <i>their</i> $14 - \text{their } ((a) \times 2.99)$</p>

Question	Answer	Marks	Part marks and guidance
15	1 hour 28 minutes with correct working	5	<p>B4 for 88 minutes with correct working</p> <p>OR</p> <p>M1 for $\frac{1}{8} + \frac{1}{4}$ oe</p> <p>A1 for $\frac{3}{8}$ oe</p> <p>AND</p> <p>M2 for $55 \div \text{their } (1 - \text{their } \frac{3}{8})$ oe or M1 for $[55 =] 1 - \text{their } \frac{3}{8}$ oe</p> <p>If 0 or 1 scored, instead award SC2 for answer 1 hour 28 minutes with no or insufficient working</p> <p>If 0 scored SC1 for answer 88 minutes with no or insufficient working</p> <p>“Correct working” requires evidence of at least M2</p> <p>M1A1 may be shown pictorially or $\frac{1}{8}, \frac{2}{8}, \frac{5}{8}$ stated M1A1 implied by $\frac{3}{8}$ or $\frac{5}{8}$ seen oe</p> <p>M2 implied by e.g. 11×8 or $\frac{440}{5}$</p> <p>M1 implied by e.g. $\frac{1}{8} = 11$ or $\frac{5}{8}$</p> <p><u>Alternative Method:</u></p> <p>M1 for [Singing=] 11 A1 for [Dancing=] 22 M1A1 implied by 33</p> <p>AND</p> <p>M2 [Total Time=] $55+22+11$ or $55+33$ or M1 [Dancing + Singing=] $22+11$ oe</p>

Question		Answer	Marks	Part marks and guidance	
16		2 8	2	B1 for each	
17	(a)	Vector a correctly drawn with direction arrow	1	Across (a) and (b), penalise first instance only where direction arrow is omitted or in the incorrect direction	
17	(b)	Vector a + b correctly drawn with direction arrow	2	<p>M1 for $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$</p> <p>or for $\begin{pmatrix} 3 \\ 2 \end{pmatrix} + \begin{pmatrix} 1 \\ -4 \end{pmatrix}$ correctly drawn in an incomplete vector triangle with or without arrows</p>	<p>Could be part of a complete vector triangle</p> <p>For 2 or 1 marks allow correct vector drawn when construction/counting lines/arcs are drawn.</p> <p>Condone omission of brackets.</p>
18		81	4	<p>B1 for 135</p> <p>AND</p> <p>M2 for <i>their</i> $(180-45) \div (3 + 2)$ [xk] oe (k = 1,2 or 3)</p> <p>or</p> <p>M1 for $x + y = \textit{their} (180-45)$ or $ECD = 45$ or $DEC = x$ or $BAC = y$</p>	<p>May be seen on diagram e.g. DCB, ECA</p> <p>Implied by 54</p>
19		36π final answer	3	<p>M1 for $\frac{4}{3} \times \pi \times 3^3$ oe</p> <p>M1dep for $\frac{4}{3} \times \pi \times 27$ or $4 \times \pi \times 3^2$ or $\frac{108\pi}{3}$ or $4 \times \pi \times 9$ or $\pi 36$ oe</p>	<p>Accept $36 \times \pi$ do not accept $\pi 36$ for 3 marks</p> <p>For method marks accept $\pi = 3.14[2\dots]$ and $1.33[3\dots]$ for $\frac{4}{3}$</p>

Question			Answer	Marks	Part marks and guidance	
20			Correct explanation $\frac{1}{2}$ omitted from the area of the cross section oe	1		See appendix Do not ignore incorrect statements
			8	2	M1 for $\frac{1}{2} \times b \times h = 24$ seen, either as a formula or with values	M1 implied by $b \times h = 48$ or a correct factor pair of 48 or e.g. $h(h+2) = 48$ oe M1 may be seen in their explanation of the error
21	(a)		Four correctly plotted points	2	B1 for 2 or 3 correct plots	Use overlay as a guide, \pm half small square radially
21	(b)		Positive	1		Do not accept description of relationship Condone embellishments e.g. strong moderate, medium etc
21	(c)		Point at (6, 1.4) indicated only	1		FT their plots from (a), If they have 2 outliers they must indicate both or just (6, 1.4)
21	(d)	(i)	Ruled line of best fit and answer FT ± 0.01 <i>their</i> straight ruled line at 8 years	2	B1 for ruled line of best fit or answer FT ± 0.01 <i>their</i> straight ruled line with positive gradient	Use overlay for LOBF, ruled line needs to reach both gates set at: (2,0.8) and (2,0.94) (13, 1.54) and (13, 1.66)
21	(d)	(ii)	This child will fit the average pattern and will not be too tall or too short for their age oe	1		See appendix Ignore incorrect statements

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21	(e)	Only have data on students up to 14 years old oe	1	<p>Accept e.g. The trend may not continue The line of best fit should not extend beyond the data provided Outside range of data provided oe Small sample Do not accept e.g. 17 is not on the graph The graph does not go to 17 (alone)</p> <p>See appendix Ignore incorrect statements</p>
22		7	3	<p>B1 for $\sin 30 = \frac{1}{2}$ oe</p> <p>M1 for $\sin 30 = \frac{a}{14}$ or better</p> <p>Accept any letter or correct identification for a e.g. x or opposite</p> <p>M1 implied by $14 \times \sin 30$ oe</p> <p><u>Alternative Method:</u> B1 for $\cos 60 = \frac{1}{2}$ oe M1 for $\cos 60 = \frac{a}{14}$ or better</p> <p>Accept equivalent Sine Rule application</p>
23	(a)	$(x + 6)(x + 4)$ final answer	2	<p>M1 for $(x + a)(x + b)$ where $a + b = 10$ or $ab = 24$ or for $x(x + 4) + 6(x + 4)$ or $x(x + 6) + 4(x + 6)$</p> <p>Condone $(x + 6)(x + 4) = 0$ and $(x + 6)(x + 4) = y$ for 2 marks</p>
23	(b)	-6 and -4	1	<p>FT <i>their</i> (a) dep on two brackets</p> <p>Allow correct solutions if part (a) incorrect</p>

Question		Answer	Marks	Part marks and guidance	
24	(a)	Correct method that would lead to 495, 60 or 8.25 oe e.g. (55 ÷ 5) × 45 or 55 × (45 ÷ 5) or 11 × 0.75 oe or 540 ÷ (45 ÷ 5)	M2	M1 for 55 ÷ 5 or 11 or 45 ÷ 5 or 0.75 or 60 × 9 oe or for repeated addition attempt at method with no more than one error	M2 may be repeated addition, done in stages etc For M2 accept e.g. 11 × 45, 45 × 10 + 45, 9 × 55, 540 ÷ 9, 540 ÷ 45 × 5 M2 implied by 495 or 60 or 8.25 or 8 mins 15 seconds For M2, do not accept incorrect time conversion e.g. 0.45 × 11
		60 [boxes] or 8.25 oe or 495 and 540	A2	A1 for 495	Accept 8 mins 15 seconds for A2
24	(b)	They continue to pack boxes at the same rate (or faster) oe	1		Accept any comment that implies the rate does not go slower e.g. They took no breaks They pack for 9 mins without stopping Each box took the same time to pack They don't get tired That they were not interrupted The boxes remain the same size and consistency That they won't make any mistakes I assumed <u>every</u> box took 9 seconds Do not accept e.g. I assumed one box took 9 seconds

Question	Answer	Marks	Part marks and guidance
25	5 and 9 with correct working	6	<p>M3 for 72 and 40 or M2 for 72 or 40 or B1 for $p + q = 112$ oe B1 for $p - q = 32$ oe or $q - p = 32$ oe</p> <p>AND</p> <p>M1 for $360 \div \text{their } p$ or $360 \div \text{their } q$ oe or $\frac{180(n-2)}{n} = 180 - \text{their } p$ or $\frac{180(n-2)}{n} = 180 - \text{their } q$ oe</p> <p>A1 for one correct answer</p> <p>If 0 or 1 scored, instead award SC2 for both answers correct with no or insufficient working If 0 scored award SC1 for one correct answer with no or insufficient working</p> <p>“Correct working” requires evidence of M3 AND M1</p> <p>$2p = 112 + 32$ oe implies B1B1 $2q = 112 - 32$ oe implies B1B1</p> <p>M1 could be repeated addition oe For M1, accept e.g. $360 \div 5 = 72$ or other convincing justification</p> <p>A1dep on at least M2 and M1 leading to that answer</p>