

Question			Answer	Mark	Guidance
1			1.19	3	B2 for 1.18[8...] or 1.189 or B1 for 125 or 1.68 and B1 for <i>their</i> answer seen to more than 3sf correctly rounded to 3sf (both rounded and unrounded values must be seen)
2			20	2	condone 1 : 20 for 2 marks B1 for [50 :] 1000 oe or $\frac{1000}{50}$ ignoring units or answer with units e.g. 20g, 1g : 20g
3	(a)		$\frac{5}{36}$ or equivalent fraction	3	M2 for $\frac{5}{3+4+5} \times \frac{1}{3}$ oe implied by e.g. [0].139, [0].1388..., 13.9%, 13.88..%, $\frac{1.6}{12}$, $\frac{1.66[6.]}{12}$, $\frac{1.67}{12}$, $\frac{1.7}{12}$, $\frac{5}{3}$ or better OR B1 for $\frac{5}{12}$ or equivalent fraction or 0.41$\dot{6}$ or better OR M1 for ($\frac{3}{3+4+5}$ or $\frac{4}{3+4+5}$) $\times \frac{1}{3}$ or $\frac{1}{3} \times 5$ oe, implied by 1.$\dot{6}$, 1.66[6...], 1.67 or 1.7 or better
3	(b)		4000	2	M1 for 1600 $\div$ 8 or (5+7+8) $\div$ 8 implied by 200 or 2.5

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4	(a)		11.37 [am]	4	B3 for 11.37 pm or B2 for listing the next 3 correct times of both buses. i.e. 8.55, 9.13, 9.31 and 8.57, 9.17, 9.37 or B1 for listing the next 3 correct times of one bus i.e. 8.55, 9.13, 9.31 or 8.57, 9.17, 9.37 Alternative method B3 for 3 [h] (must be sure 3 is not minutes) or B2 for [LCM=] 180 or answer 14 37 or 2 37 pm or M1 for [18=] 2×3^2 or [20=] $2^2 \times 5$ allow in a tree diagram etc or [LCM=] $180k$ ($k \neq 1$) or B1 for listing the next 3 multiples of 18 and 20 i.e. 36, 54, 72 and 40, 60, 80 See appendix for other methods SC2 for answer 14 37 oe
4	(b)		accept any correct assumption e.g. buses keep to the timetable or there are no delays or there are no changes to the timetable or they do not cancel any buses	1	see the appendix for other comments, if there is more than one comment mark the best one providing there are no incorrect comments

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5	9 16 32	6	allow any letter providing use is consistent this method assumes Ayesha's age = a B4 for $a + a + 7 + 2(a + 7) = 57$ or better OR B1 for $[b=] a + 7$ oe e.g. $a = b - 7$ B1 for $c = 2b$ oe e.g. $\frac{c}{2} = b$ or $[c =] 2(a + 7)$ B1 for <i>their</i>'a' + <i>their</i>'b' + <i>their</i>'c' = 57 e.g. $a + b + c = 57$ must be algebraic AND M1FT for correctly solving <i>their</i> linear equation in one variable e.g. $4a = 36$ and $a = 9$ AND M1 for substituting <i>their</i> a into $b = a + 7$ and $c = 2b$ e.g. $a = 8$, $b = 15$ and $c = 30$ implied by <i>their</i> answer which must be integers see appendix for other methods mark working first, if <u>0 scored</u> then SC2 for 2 answers correct in the correct place or SC1 for 1 answer correct in the correct place or if <u>1 scored</u> then award the better of 1 or SC2 for 2 answers correct in the correct place to a maximum of 5 marks

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		[Year 10] [left]17 and [total] 61 [Year 11] [left] 20 and [total] 59 and a comparison such as there are more Year 11 left-handers [than Y10] and there are fewer Year 11s [than Y10] in total or two comparable figures e.g. $[\frac{17}{61} =] .28$ or .279 or .27[8...] or 28% or $\frac{1003}{3599}$ oe $[\frac{20}{59} =] .34$ or .339 or .33[8...] or 34% or $\frac{1220}{3599}$ oe and conclusion e.g. Y11	6	B5 for [Year 10] 17 with 61, and [Year 11] 20 with 59 (eg as fractions, or “out of”) and B1 for a comparison and conclusion e.g. two comparable figures or a statement such as “there are more Year 11 left-handers [than Y10] and there are fewer Year 11s [than Y10] in total” or the following marks may be seen in their working or in the table B4 for [Year 10] 17 with 61 and [Year 11] 20 with 59 or B3 for [Year 10] 17 with 61 or [Year 11] 20 with 59 or B2 for 17 or both 37 and 59 or B1 for 37 or 59 if percentages used we must see % sign or use “out of 100 people ...”

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7			109 or 108.8 to 108.9	6	figures and working may be on diagram B1 for [radius of circle =] 9 B1 for [AB or ED =] 32 soi by 41 – <i>their</i> 9 M1 for $\frac{1}{4} \times 2 \times \pi \times$ <i>their</i> 9 soi by $\frac{9\pi}{2}$, 14.1 or 14.13 to 14.14 M2 for $\sqrt{(their\ 9)^2 + (their\ 9)^2}$ soi by $9\sqrt{2}$, 12.7[2...] or 12.73 or M1 for $(their\ 9)^2 + (their\ 9)^2$ soi by 162 M1 for <i>their</i> 12.72... + <i>their</i> 14.1 + 2 × <i>their</i> 32 + 18 seen to a maximum of 5 marks
8	(a)		Rotation or enlargement [centre] (̄ 1, 0) [centre] (̄ 1, 0) 180° [sf] -1	1 1 1	double transformation scores 0, 0, 0 must be coordinates, condone missing final bracket ignore direction
8	(b)		Reflection x = 5	1 2	double transformation may only score B1 below B1 for drawing line x = 5 or for a correct mirror line of <i>their final image</i> , not x = 3, drawn or written or for a correct final image or a correct follow through translation of the reflection of <i>their object</i> or the correct reflection of <i>their object</i>
9	(a)		a, A, [angle] BAC or [angle] CAB corresponding	1 1	not numbers Condone misspellings e.g. correspondent but not F angles. Any longer reasons must be correct and complete.
9	(b)		angle BCD = b or ABC or CBA alternate angle[s] [on a] line [add to 180]	1 1 1	allow written on the diagram not Z angles condone 'straight line'

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10			2 602.02 cao	4	B3 for 27 602.02 soi by 2 602[.02...] as final answer or M2 for $25\,000 \times (1.02)^5$ oe implied by 27 602[.02...] see appendix or M1 for $25\,000 \times (1.02)^k$ oe implied by 26 010 ($k \neq 5$ and $k \geq 2$) see appendix
11			$[55.5 \div 9.25 \text{ or } 9.249 \Rightarrow] 6$	4	6 must not come from a rounded answer B1 for 55.5 B1 for 9.25 condone 9.2499 or better M1 for <i>their</i> $55.5 \div \text{their } 9.25$ ($55.5 \leq \text{their } 55.5 \leq 56.5$ and $9.15 \leq \text{their } 9.25 \leq 9.25$)
12	(a)		$5n - 6$ or $-1 + 5(n - 1)$ oe	2	condone $+ -6$ etc for 2 marks B1 for $5n + c$
12	(b)		$[a =] 6$ $[b =] -15$	5	B1 for $3^2a + 3b = 9$ or better B1 for $6^2a + 6b = 126$ or better M1 for equating the coefficients of a variable, e.g. $18a + 6b = 18$, allow one numerical error M1 for correctly eliminating one variable, e.g. $18a = 108$, allow one numerical error allow any correct method

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13	(a)	(i)	172	1	
13	(a)	(ii)	16 to 17	2	B1 for 160 or 176 to 177 (may be written or indicated on graph, not just a line through it)
13	(a)	(iii)	16.6 to 16.7 or 17	3	B2 for [0].83[3...] or 83[.3...]% or [0].166... or [0].167 or [0].17 OR B1 for 100 (from graph) or 20 M1 for $\frac{\text{their } 100}{120} [\times 100]$ or $\frac{\text{their } 20}{120} [\times 100]$
13	(b)		76.5 or 77 and 102 or both 28 (or 14+14) and 74 Swimming club has a median in group 160 to 170 oe [Rowing club has median <i>their</i> 172] So rowing club [has higher median] oe FT <i>their</i> (a)(i) for conclusion	5	B1 for 76.5 or 77 M2 for 20×1.4 and 10×7.4 soi by 102 or both 28 (or 14+14) and 74 or M1 for 20×1.4 or 10×7.4 soi by 28 (or 14+14) or 74 Accept any correct alternative methods (e.g. 5 squares = 1 person) B1 for [swimming club has a median in group] 160 to 170 oe e.g. " ≤ 170 " (if they use a proportional calculation answer 166 to 167) A1dep on previous 4 marks for "rowing club [has higher median]" oe FT <i>their</i> (a)(i) for conclusion
14	(a)		12	1	condone "greater than 12" or "> 12"
14	(b)		Acceleration is constant oe	1	see appendix for acceptable answers
14	(c)		15.8[3...] or 16 if no evidence of incorrect working	5	M1 for attempt to find an area under the graph (eg $\frac{1}{2} \times 15 \times 20$) soi by e.g. 150, 700, 100 or 950 M2 for $\frac{1}{2} [(50 - 15) + 60] \times 20$ oe or 950 or M1 for a total area attempt with one error M1dep for <i>their</i> $950 \div 60$, dep. on attempt at total area under graph
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15		Accept any correct justification e.g. two of $OC = \mathbf{a} + 2\mathbf{b}$ $OD = 2\mathbf{a} + 4\mathbf{b}$ $CD = \mathbf{a} + 2\mathbf{b}$ and correct conclusion e.g. $OD = 2(\mathbf{a} + 2\mathbf{b}) = 2OC$ or OD is a multiple of OC or $OC = CD$ (must be consistent with vectors found)	5	B1 for $[AB =] 3\mathbf{b} - 3\mathbf{a}$ oe M1 for each of e.g. $OC = 3\mathbf{a} + \frac{2}{3}(3\mathbf{b} - 3\mathbf{a})$ oe soi by $\mathbf{a} + 2\mathbf{b}$ $OD = 3\mathbf{b} + 2\mathbf{a} + \mathbf{b}$ oe soi by $2\mathbf{a} + 4\mathbf{b}$ $CD = \frac{1}{3}(3\mathbf{b} - 3\mathbf{a}) + 2\mathbf{a} + \mathbf{b}$ oe soi by $\mathbf{a} + 2\mathbf{b}$ to a maximum of M2 and may be on diagram and condone notation OCD for OD only M1 for $[OD =] 2(\mathbf{a} + 2\mathbf{b})$ or $2OC = OD$ or $OC = CD$ and must be consistent with vectors found If 0 scored M1 for any correct route leading to OC, CD or OD e.g. $OC = OB + BC$
16	(a)	any correct method e.g. two of $[y \times \sqrt{x} =] 6 \times \sqrt{4} = 12, 3 \times \sqrt{16} = 12, 2 \times \sqrt{36} = 12$ oe or use one pair to find $y = \frac{12}{\sqrt{x}}$ and check with another pair	2	accept 6 for $\sqrt{36}$ etc M1 for correct method with one error or omission or uses $y = \frac{k}{\sqrt{x}}$ to find $k = 12$ or one of $[y \times \sqrt{x} =] 6 \times \sqrt{4} = 12, 3 \times \sqrt{16} = 12, 2 \times \sqrt{36} = 12$ alternative method : show x is $\times 4$ and $\times 9$ and y is $\div 2$ and $\div 3$.
16	(b)	$a = \frac{60}{b^2}$ oe	3	condone answer of $a \propto \frac{60}{b^2}$ for 2 marks or M1 for $a = \frac{k}{b^2}$ oe implied by $3.75 = \frac{k}{4^2}$ B1 for $[k =] 60$
17		$[(a^3)^{-\frac{1}{3}} =] a^{-1}$ or $\frac{1}{a}$ $[(a^2)^{\frac{1}{2}} =] a^{[1]}$ or $\frac{a^{[1]}}{1}$ $\frac{1}{a} \times a$ or a^0 or $\frac{a}{a} [= 1]$	1 1 1dep	condone x etc instead of a but not numbers only dep on both previous marks
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18		Three correct lines and region R correctly labelled with an 'R' or unambiguous wording or shading	6	B1 for line $y = 3$ and B1dep indicates correct side B1 for line $y = x$ and B1dep indicates correct side B1 for line $x + y = 9$ and B1dep indicates correct side to a maximum of 5 marks Condone good freehand lines, which can be dashed or solid. Mark the region which is labelled, but if no labelling mark the single region which is shaded (or unshaded). Condone regions that are just in the first quadrant. <u>Region mark depends on the line being a close attempt.</u> Note : lines need only be one square long for line mark but they must be fit for purpose to define their region up to the intersections and the y-axis.
19		-3.19 [0].52 with some correct algebraic working	4	M2 for correct substitution into the formula, allow one error e.g. $\frac{-8 \pm \sqrt{8^2 - 4 \times 3 \times -5}}{2 \times 3}$ or for e.g. $3\left[\left(x + \frac{8}{6}\right)^2 - \left(\frac{8}{6}\right)^2\right] - 5 = 0$ oe and $x = \sqrt{\frac{5}{3} + \left(\frac{8}{6}\right)^2} - \frac{8}{6}$ oe or better or M1 for correct substitution into the formula, allow two errors or for e.g. $3\left[\left(x + \frac{8}{6}\right)^2 - \left(\frac{8}{6}\right)^2\right] - 5 = 0$ oe or better and A1 for -3.19 or [0].52 or for both solutions correct but to more than 2dp. e.g. -3.189254... or 0.522588..... If 0 scored allow SC1 for two correct answers with no correct algebraic working.