Question	Answer	Marks	Notes and guidance
1	288	2	Award 1 mark for correct method.
	336	3	Award 2 marks for attempt to find areas of all five faces and find the total, including correct formula for area of triangle. Award 1 mark for area of at least 3 faces.
2	Correct graph of $y = 4x - 3$ drawn	4	Award 2 marks for table/list of values with at least three points correct. Award 1 mark for one correct point. Award 2 marks for fully correct graph. Award 1 mark for at least 3 of their values correctly plotted on a pair of axes.
3	$y = 6 - 2x$	2	Accept any equivalent form with y as the subject e.g. $y = \frac{12 - 4x}{2}$ Award 1 mark for correct first step e.g. $2y = 12 - 4x$ or $2x + y = 6$
	-2	1	Follow through from their answer to the first part.
4	Indicates "x is inversely proportional to y"	1	Accept any clear indication – tick, circles, underline etc.
	25	1	
5	$8 > m$ or $m < 8$	2	Award 1 mark for fully correct method or $m = 8$

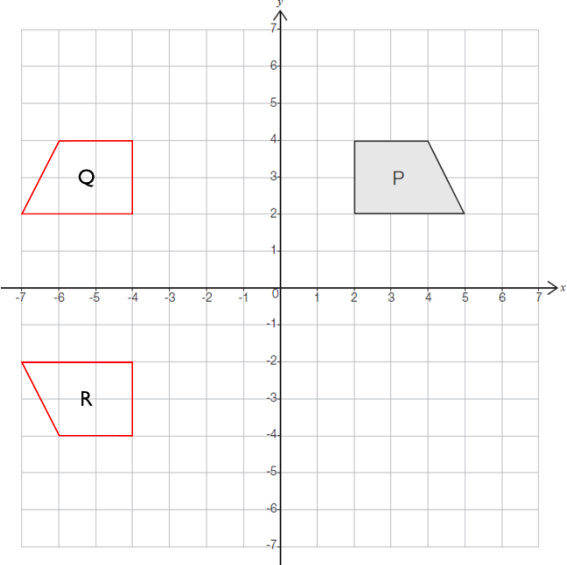|			
6	$-\frac{1}{2}$ or any equivalent value	2	Award 1 mark for correct method e.g. with wrong scale.
	$y = -\frac{1}{2}x - 1$	1	Allow any correct form. Follow through form their gradient
7	100π	2	Award 1 mark for correct substitution into formula seen or implied e.g. $\frac{1}{3} \times \pi \times 5^2 \times 12$ or 314.15….
8	Correct perpendicular drawn with construction lines visible	2	Award 1 mark for correct method.
9	$b = \sqrt{c^2 - a^2}$	2	Award 1 mark for correct first step i.e. $b^2 = c^2 - a^2$
10	Completes table with $x + 2, x + 10, x + 12$	1	
	$(x + 2)(x + 10) - x(x + 12)$ $x^2 + 12x + 20 - x^2 - 12x$ 20	2	Award 2 marks for fully correct proof. Award 1 marks for attempt to multiply both sets of brackets and subtract/compare expressions.
11	Correct region drawn i.e. 	3	Award 1 mark for quarter circle drawn from D. Award 1 mark for attempt to bisect angle BCD. Award 3rd mark for shading correct region.

12	Indicates True and justifies e.g. $3 \times -\frac{1}{3} = -1$	1	
13	3	2	Award 1 mark for equation $\pi r^2 h$ to 72π, substituting h and attempting to find r^2 or r.
14	Fully correct proof that triangles are congruent e.g. $180 - 41 - 42 = 97$ 7 cm = 70 mm Both triangles have a side of 7 cm with angles 41 and 72, so they congruent (ASA).	3	Award 1 mark for finding missing angle in either triangle. Award 2nd mark for showing sides lengths are the same. Award 3rd mark for stating they are congruent with correct condition.
15	$\frac{3}{8} \geq x$ or $x \leq \frac{3}{8}$	3	Allow 0.375 for $\frac{3}{8}$ Award 1 mark for forming correctly inequality $7 - 5x \geq 3x + 4$ or $3x + 4 \leq 7 - 5x$ Award 2nd mark for isolating x and simplifying constants e.g. $3 \geq 8x$ Do not penalise if using > and < instead of $\geq$ or $\leq$.
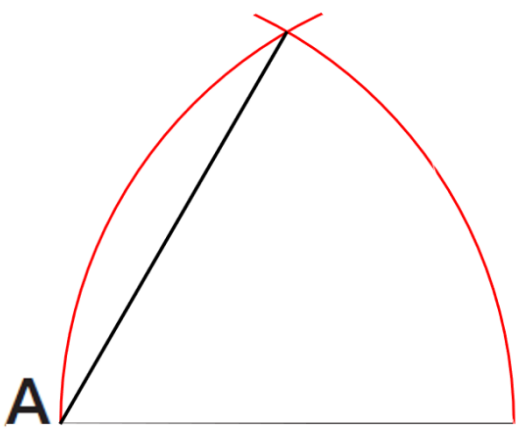
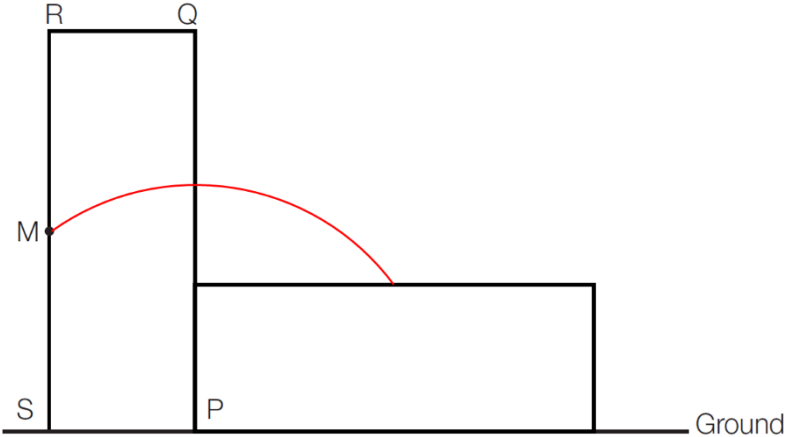| Question	Answer	Marks	Notes and guidance
1	700π	3	Award 1 mark either area of base (100π)or curved surface area (600π)correctly calculated, allow decimals Award 2nd mark for both correct 2199.11... or rounded implies 2 marks out of 3
2	1.5	3	Award 1 mark for 450 ÷ 5 or 90 seen. Award 1 mark for correct method to find rate of interest e.g. 90 ÷ 6000 × 100%
	Indicates 6000×1.035^5	1	Allow any clear indication – circle, underlined, tick etc.
3	1080	2	Award 1 mark for 20% = 180 used to find 100% or 120% seen or implied
4	121 supported with reasoning	3	Award 1 mark for either $\angle$AEB = 65° or $\angle$EAB =56° seen or implied (could be on diagram) Award 2nd mark if x found to be 121° Award 3rd mark for any fully correct chain of reasoning, with correct mathematical statements throughout

| 5 |
Rotation 180° about $(-1, 0)$ | 3 | Award 1 mark for shape **P** correctly reflected through $x = -1$ to give shape **Q**

Award 1 mark for their shape **Q** correctly reflected through the x-axis to give shape **R**

Award 1 mark correctly describing single transformation of shape **P** to their shape **R** provided this is a rotation |
| 6 | 10 800 | 3 | Award 1 mark for any correct method to find the car value after 1st year e.g. 15 000 × 0.8
Award 1 mark for any correct method to find the car value after 2nd year e.g. their 12 000 × 0.9 |
| | 35% | 2 | Award 1 mark for any correct method to find 20 000 − 13 000 as a percentage of 20 000 |

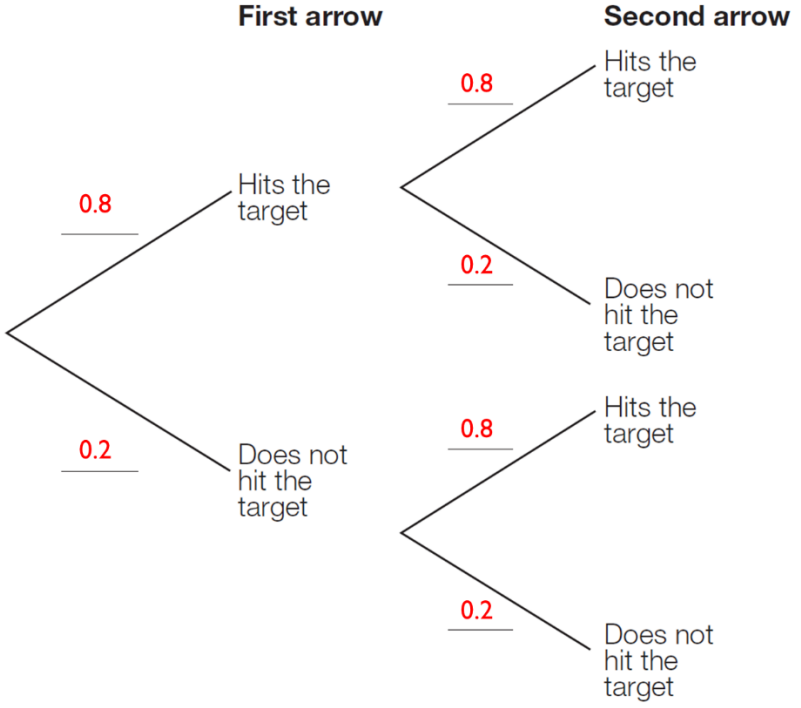| 7 | 80 | 2 | Award 1 mark for correctly substituting m and v into the formula |
	$m = \frac{2K}{v^2}$	2	Award 1 mark for any correct first step taken to rearrange formula e.g. $2K = mv^2$ or $\frac{1}{2}m = \frac{K}{V^2}$
8	Indicates "Never True"	1	Allow any clear indication – circle, underlined, tick etc.
	Indicates "Sometimes True"	1	
9	e.g. $4x + 2y = 10 \rightarrow y = 5 - 2x$, so both have gradient of -2	2	Award 1 mark for valid attempt to find gradient of both lines Award 2nd mark for fully correct justification
10	e.g. 	2	Award 1 mark for first arc crossing the given line Awards 2nd mark for correct construction at X, allow $\pm\,2°$ No marks if no arcs seen Award 1 mark maximum for correct construction seen elsewhere on the line Condone equilateral triangle fully constructed.
11	$3\frac{1}{3}$	2	Award 1 mark for answer in any other form e.g. 3.33… or $\frac{10}{3}$

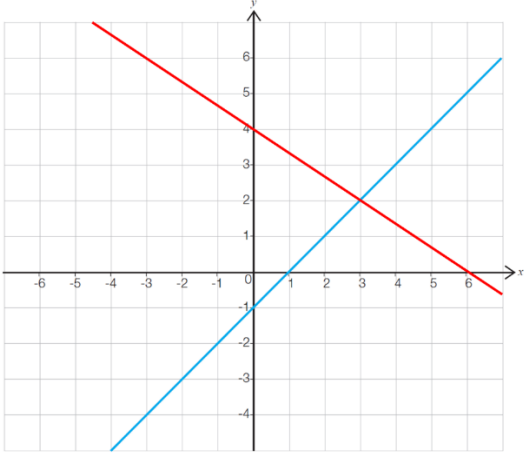| 12	e.g. $\sqrt{0.25} = \sqrt{\frac{1}{4}} = \frac{1}{2}$	2	Award 1 mark for $\sqrt{0.25} = 0.5$
13	e.g. AC $= \sqrt{12^2 + 5^2}(= 13)$ AG $= \sqrt{13^2 + 5^2} = 13.928\ldots$ or $\sqrt{12^2 + 5^2 + 5^2}$ $13.938\ldots < 14$	4	Award 1 mark for any correct use of Pythagoras' theorem Award 2nd mark for any correct relevant length found e.g. AC $= 13$ cm Award 3rd mark for 2nd use of to find AG $= 13.928$ (may get 2nd and 3rd mark in one step if using $\sqrt{12^2 + 5^2 + 5^2}$) Award final mark for comparison with 14 cm
14		3	Award 1 mark correct size and new position of rectangle PQRS. Award 1 mark for arc drawn of radius PM centre P Award 3rd mark for arc ending on the "new" SR

Question	Answer	Marks	Notes and guidance
1	108	2	Award 1 mark for $\frac{1}{3} \times 6^2 \times 9$ seen or implied.
2	$-\frac{4}{3}$	2	Accept any equivalent form Award 1 mark for correct process to make y the subject i.e. $y = \frac{8}{3} - \frac{4}{3}x$
3	21600	2	Award 1 mark for $20000 \times 1.2 \times 0.9$ or equivalent complete method
4	$\begin{pmatrix} -2 \\ -8 \end{pmatrix}$	2	Award 1 mark for shape C correctly positioned $(-1, 3)$, $(1, 4)$, $(-2, 3)$, $(-2, 4)$ or translation vector of A to C seen $\begin{pmatrix} 2 \\ 8 \end{pmatrix}$
5	120	2	Award 1 mark for $\sqrt{5} \times \sqrt{5} = 5$ seen or implied.
6	$r = \sqrt{\frac{A}{4\pi}}$	2	Award 1 mark for correct first step to rearrange the formula e.g. divide both sides by 4π or square root both sides
7	e.g. Exterior angle: $180° - 160° = 20°$ No. of sides: $360° \div 20° = 18$ Perimeter: $18 \times 12 = 216$ cm 216 cm $= 2.16$ m > 2 m	3	Award 1 mark for a correct process to calculate the number of sides Award 1 mark for a correct process to calculate the perimeter Award full marks for fully correct method with conclusion
8	$x, x + 1, x + 2$ $x + x + 1 + x + 2 \equiv 3x + 3 \equiv 3(x + 1)$	2	Award 1 mark for correct first step e.g. attempt to sum expressions for 3 consecutive integers Award 2nd mark for fully correct proof

9	e.g. $\sqrt{10^2 - 6^2} = \sqrt{64} = 8$ $x = \sqrt{8^2 + 8^2} = \sqrt{128}$ $\sqrt{121} < \sqrt{128} < \sqrt{144}$ So $11 < x < 12$	3	Award 1 mark for correct use of Pythagoras' theorem to find missing side in first triangle Award 2nd mark for correct use of Pythagoras' theorem in second triangle Award full marks for clear justification that x is between 11 and 12
10	12	2	Award 1 mark for correct method to find scale factor between △ABC and △ DEF (1.5)
11		2	Award 1 mark for 'First arrow' probabilities correctly labelled Award full marks for fully correct tree Accept equivalent probabilities
	0.04	2	Award 1 mark for 0.2×0.2 seen or implied.

12	Sometimes true	1	
	Sometimes true	1	
13	$\frac{y}{x}$ with justification	1	Accept any correct explanation e.g. $\frac{3}{2} > \frac{2}{3}$ Do not accept $\frac{y}{x}$ with no or incorrect explanation.
	$a = 12$	2	Award 1 mark for scaling ratios or forming equation from ratios e.g. $\frac{a}{18} = \frac{8}{a}$
14	e.g. Run: 7 m/s = 420 m/min = 25 200 m/h = 25.2 km/h > 20 km/h, so running is faster OR Bike: 20 km/h = 20 000 m/h = 20000 ÷ 3600 m/s = 5.55.. m/s < 7 m/s, so running is faster	3	Award 1 mark correctly converting units of distance or time to make comparison Award 2nd mark for correctly converting both units to make comparison Award full marks for correct conclusion with supporting work.
15		2	Award 1 mark for correct table of values or
	$x = 3, y = 2$	1	Follow through their intersection point

16	e.g. ∠ABY = ∠XCD (given) AB = CD (opposite sides of a parallelogram are equal) ∠BAD = ∠BCD (opposite angles of a parallelogram are equal) So △ ABY and △ XCD are congruent with (AAS)	3	Award 1 mark for any correct equality with reason Award 2nd for a second correct equality with reason Award full marks for complete proof with AAS condition stated