

Q1. (2017)

9(a)	2 or two	B1	Allow words which imply two times eg double, twice
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Q2. (2017)

9(b)	÷ 4	B1	
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Q3. (2019)

10 The number of items, n , made in 1 hour by a machine is given by $n = \frac{60}{t}$

t is the time in minutes the machine takes to make one item.

The value of t changes for different types of item.

10(a)	Plots the points (1, 60), (2, 30), (3, 20) and (4, 15)	M1	$\pm \frac{1}{2}$ small square
	Correct smooth curve through correct four points	A1	$\pm \frac{1}{2}$ small square
	Additional Guidance		
	Ignore any calculations and mark the graph only		
	Points cannot be implied by a bar chart or vertical line graph, but condone crosses at the top of a vertical line graph for M1 and the correct curve superimposed for M1A1		
	For M1, ignore the curve outside the domain $1 \leq t \leq 4$ For A1, whether or not the curve extends outside the domain $1 \leq t \leq 4$ it must not have a positive gradient at any point		
	If there is no curve, for M1 there must be no other points with x-coordinate 1, 2, 3 or 4		
	The curve should be a single line with no feathering		
	Unless it affects the shape of the curve (in which case A1 cannot be awarded), ignore incorrect evaluations of $60 \div$ a non-integer value eg $60 \div 1.5 = \dots$		

Q4. (2021)

Question	Answer	Mark	Comments
20	g/cm^3	B1	

Q5. (2023)

Q	Answer	Mark	Comments
17	Alternative method 1 – expressions in x		
	$4\pi x^2 \div 2$ or $2\pi x^2$ or πx^2 or $\pi(3x)^2$ or $9\pi x^2$ or $2 \times \pi(3x)^2$ or $18\pi x^2$ or $2\pi x(3x)$ or $6\pi x^2$	M1	oe area of curved face of hemisphere oe area of flat face of hemisphere oe area of one flat face of cylinder oe area of both flat faces of cylinder oe area of curved face of cylinder
	$4\pi x^2 \div 2 + \pi x^2$ or $3\pi x^2$ or $\pi(3x)^2 + \pi(3x)^2 + 2\pi x(3x)$ or $9\pi x^2 + 9\pi x^2 + 6\pi x^2$ or $24\pi x^2$	M1dep	oe total surface area of the hemisphere oe total surface area of the cylinder
	$3\pi x^2$ and $24\pi x^2$ and $1 : 8$	A1	either order
	Alternative method 2 – substituting a value for x		
	Substitutes a value for x and works out the area of at least one of area of curved face of hemisphere area of flat face of hemisphere area of one flat face of cylinder area of both flat faces of cylinder area of curved face of cylinder	M1	eg using $x = 5$, at least one of 50π 25π 225π 450π 150π
17 cont	Substitutes a value for x and works out an expression for the total surface area of the hemisphere or the cylinder	M1dep	eg using $x = 5$ total surface area of hemisphere = $25\pi + 50\pi$ or 75π or total surface area of cylinder = $225\pi + 225\pi + 150\pi$ or 600π
	Both correct total surface areas for their value of x and $1 : 8$	A1	either order
Additional Guidance			
17 cont	$1 : 8$ or $8 : 1$ without correct working or values	M0M0A0	
	Condone π missing consistently for all marks		
	Allow 'correct' and consistent values of π throughout (eg 3, 3.14, $\frac{22}{7}$)		
	Condone use of r for x throughout		
	Do not allow $3\pi x^2$ from $3x \times \pi \times x$ oe		