

Q1. (2017)

28	Alternative method 1		
	$\frac{1}{3} (\pi) \pi (\pi) 5^2 (\pi) 15$ or 125π or [392.5, 392.8]	M1	oe
	$\frac{r}{5} = \frac{15-9}{15}$ or $r=2$	M1	oe r is radius of small cone
	$\frac{1}{3} \times \pi \times \text{their } 2^2 \times (15-9)$ or 8π or [25.12, 25.14]	M1dep	dep on 2nd M1
	117π	A1	Accept $\pi 117$ or $\frac{351\pi}{3}$
	Alternative method 2		
	$\frac{1}{3} (\pi) \pi (\pi) 5^2 (\pi) 15$ or 125π or [392.5, 392.8]	M1	oe
	volume sf = $\left(\frac{15-9}{15}\right)^3$ or $\frac{8}{125}$ or $\left(\frac{15}{15-9}\right)^3$ or $\frac{125}{8}$	M1	oe
	their $125\pi \times \text{their } \frac{8}{125}$ or their $125\pi \div \text{their } \frac{125}{8}$ or 8π or [25.12, 25.14]	M1dep	dep on 2nd M1 Accept $1 - \frac{8}{125}$ or $\frac{117}{125}$
	117π	A1	Accept $\pi 117$ or $\frac{351\pi}{3}$
Additional Guidance			
Allow [3.14, 3.142] for π for M marks only			
Answer of 367.(...)			M1M1M1A0

Q2. (2019)

13	One of (102 $\rightarrow$) 100 (8.14 $\rightarrow$) 8	M1	
	their $100 = 0.5 \times x^2 \times \text{their } 8$ or ($x^2 \Rightarrow$) their $100 \div 8 \times 2$ or ($x^2 \Rightarrow$) $100 \div \text{their } 8 \times 2$ or 25 or their $8 \times 5 \times 5 \times 0.5 = 100$ or $8 \times 5 \times 5 \times 0.5 = \text{their } 100$	M1dep	oe must have used at least one correct 1 sf value
	5 with M2 seen	A1	
	Additional Guidance		
	If working is done with approximations and with the given values ignore the working with the given values and mark the working with approximations		

Q3. (2020)

Q	Answer	Mark	Comments
27	9 : 25	B1	oe ratio
	3 : 5	B1	oe ratio allow $\sqrt{9} : \sqrt{25}$
	Additional Guidance		
	25 : 9		B0
	5 : 3		B0
Answers transposed			B0B0

Q4. (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
	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

Question 17 continues on the next page

17 cont	Additional Guidance	
	$1 : 8$ or $8 : 1$ without correct working or values	MOM0A0
	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	