

## Volume and Surface Area of Cylinders Past Paper Questions (MS)



Q1.

PAPER: IMA0 2H				
Question	Working	Answer	Mark	Notes
		14.4	3	M1 for $\pi \times 6.5^2 \times 11.5$ (=1526.42...) M1 (dep) for $\frac{1526.42...}{\pi \times 5.8^2}$ A1 for 14.4 - 14.5  OR M1 for $\frac{5.8}{6.5}$ or $\frac{6.5}{5.8}$ or 0.89(23...) or 1.12(06896...) M1 for $11.5 \div \left(\frac{5.8}{6.5}\right)^2$ or $11.5 \div \left(\frac{6.5}{5.8}\right)^2$ A1 for 14.4 - 14.5

Q2.

Question	Working	Answer	Mark	Notes
	$\frac{1}{2}$ litre = 500ml $500 = \pi \times 4^2 \times h$ $h = 500 \div (\pi \times 4^2)$	9.95	5	B1 $\frac{1}{2}$ litre = 500ml or 500 seen M1 $\pi \times 4^2 \times h$ (= 50.2. × h) or $\pi \times 4^2$ (= 50.2..) M1 # "500" = $\pi \times 4^2 \times h$ oe M1 (h =) "500" $\div (\pi \times 4^2)$ oe A1 9.9 – 10.0

Q3.

Question	Working	Answer	Mark	Notes
		12.7	3	M1 for $3.142 \times 5 \times 5$ oe or $3.142 \times 5 \times 5 \times 'h'$ (=78.5 – 78.55) M1 for $1000 \div (3.142 \times 5 \times 5)$ A1 for 12.7 – 12.8 NB: multiples of $\pi$ acceptable for M marks

Q4.

Question	Working	Answer	Mark	Notes
	$\text{Vol cylinder} = \pi \times (2x)^2 \times 9x$ $= 36\pi x^3$  $36\pi x^3 = \frac{4}{3} \pi r^3$  $r^3 = 27x^3$	$3x$	3	M1 for sub. into $\pi r^2 h$ eg. $\pi \times (2x)^2 \times 9x$ oe M1 for $\pi \times (2x)^2 \times 9x = \frac{4}{3} \pi r^3$ oe  A1 oe eg. $\sqrt[3]{\frac{36x^3}{\frac{4}{3}}}$  NB : For both method marks condone missing brackets around the 2x

Q5.



Question	Answer	Mark	Mark scheme	Additional guidance
	Yes (supported)	P1	for a process to find the volume of 1 tank eg $\pi \times 40^2 \times 160$ (= 804247.7... or 804.2... or 256000 $\pi$ )	Could be truncated or rounded
		P1	for complete process to find the volume of 4 tanks, [volume of tank] $\times$ 4 eg $\pi \times 40^2 \times 160 \times 4$ (= 3216990.8... or 3216.9... or 1024000 $\pi$ ) or for process to find volume of fertiliser available per tank eg $32 \times 1000 \div 4$ (= 8000)	For this mark [volume of tank] must come from a calculation involving $\pi$ , $r^2$ , $h$
		P1	for a process to find the amount of mixture for 1 tank eg [volume of tank] $\div$ 101 (= 7962.8...) or 4 tanks (= 31851.3...) OR for a process to find volume of mixture that 32 litres of fertiliser will make eg $32000 \times 101$ (= 3232000) or $32 \times 101$ (= 3232)	For this mark [volume of tank] must come from a calculation involving $\pi$ , $r^2$ , $h$
		C1	for Yes supported by correct figures shown eg a comparable figure in the range 31.8 to 31.9 (litres) or in the range 31800 to 31900 with 32000 (cm <sup>3</sup> ) or in the range 3216 to 3217 with 3232 (litres) or in the range 3216000 to 3217000 with 3232000 (cm <sup>3</sup> ) or in the range 7958 to 7963 with 8000 (cm <sup>3</sup> )	There are other possible pairs of values which can be used in the comparison

Q6.

Paper: 5MB3F_01					
Question	Working	Answer	Mark	Notes	
		77 – 77.2	4	M1 for $\pi \times 40^2 \times 90$ (= 452389. ...) M1 for “452389” – 65000 (= 387389. ...) M1 (dep on at least M1) for “387389. ...” $\div (\pi \times 40^2)$ A1 for answer in the range 77 to 77.2 OR M1 for $\pi \times 40^2$ (= 5026. ...) M1 for 65000 $\div$ “5026. ...” (= 12.93...) M1 (dep on at least M1) for 90 – “12.93” A1 for answer in the range 77 to 77.2	