

Q	Marking instructions	AO	Marks	Typical solution
16	Uses the symmetry of the curve. Evidenced by doubling area from $x = 0$ to $x = 2$ Or considering the whole region from $x = -2$ to $x = 2$	3.1a	M1	$\text{Area} \approx \frac{0.4}{2} (3 + 0 + 2[2.943 + 2.752 + 2.353 + 1.572])$ $= 4.448$ Total area = 8.896 Volume = 8.896×150 $= 1334.4 \text{ cm}^3$ $\approx 1300 \text{ cm}^3$
	States or uses $h = 0.4$ OE Accept 0.2 as the multiplier. PI by 4.448 or 8.896 Accept use of $h=0.8$ or multiplier of 0.4 provided their answer is not then doubled.	2.2a	B1	
	Substitutes given y values or absolute y values to achieve $3 + 0 + 2[2.943 + 2.752 + 2.353 + 1.572]$ or $-3 + 0 + 2[-2.943 - 2.752 - 2.353 - 1.572]$ or $0 + 0 + 2 \left[\begin{array}{l} 2.943 + 2.752 + 2.353 + 1.572 \\ + 3 + 2.943 + 2.752 + 2.353 + 1.572 \end{array} \right]$ or $0 + 0 + 2 \left[\begin{array}{l} -2.943 - 2.752 - 2.353 - 1.572 \\ -3 - 2.943 - 2.752 - 2.353 - 1.572 \end{array} \right]$ Condone missing or misplaced zeros PI by ± 22.24 or ± 44.48	1.1a	M1	
	Obtains ± 8.896 or ± 4.448 Do not award this mark if they go on to obtain ± 17.792	1.1b	A1	
	Obtains AWRT 1300 cm^3 Or AWRT 0.0013 m^3 Must include units	3.2a	A1	
	Question 16 Total		5	