

Question Number	Scheme	Marks
<b>10(a)</b>	$4a^2 = 16a \quad a = 4$	M1A1 (2)
<b>(b)</b>	$A$ is $(4, 8) \quad x_B = 8$ (accept $B$ is $(8, 0)$ )	M1A1 (2)
<b>(c)</b>	$(\text{Vol} = \pi) \int_0^4 y^2 dx = (\pi) \int_0^4 16x dx$ $= (\pi) [8x^2]_0^4$ $\text{Vol of cone} = \frac{1}{3} \pi \times 8^2 \times 4 \left( = \frac{256\pi}{3} \right)$ or $\pi \int_4^8 (-2x + 16)^2 dx$ $128\pi + \frac{256\pi}{3} = 670$	M1 dM1 B1 NB A1 on e-PEN ddM1A1cao (5) [9]
<b>(a)</b> <b>M1</b> <b>A1</b> <b>(b)</b> <b>M1</b> <b>A1</b> <b>(c)</b> <b>M1</b> <b>dM1</b> <b>B1</b> <b>ddM1</b> <b>A1cao</b>	Use the coordinates of $A$ and the equation of $C$ to form an equation in $a$ and solve to $a = \dots$ $a = 4$ Use their value of $a$ and attempt to obtain the $x$ coordinate of $B$ . May find the equation of $l$ or draw a diagram. Award by implication if the correct value is written down. $x_B = 8$ For $\int 16x dx$ seen explicitly or implied by subsequent work. Limits and $\pi$ not needed Attempt the integration. Limits and $\pi$ not needed. Depends on the first M mark NB A1 on e-PEN Correct volume of the cone, as a product from using the formula or in integral form <b>with correct limits</b> Include $\pi$ , substitute the limits 0 to their $a$ in the volume of rev of the curve, evaluate the volume of the cone and add their two volumes. Depends on both the above M marks. Correct complete volume, <b>must</b> be 3 sf.  <b>Attempts at line – curve or curve – line:</b> $\int [16x - (-2x + 16)]^2 dx$ scores M0 (so 0/5) $\int [16x - (-2x + 16)^2] dx$ scores M1 If $16x$ is integrated on its own award dM1 but no more marks are available. If $\int [-4x^2 + 80x - 256] dx$ is attempted award dM0	

