

| Question Number | Scheme | Marks |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 2 | $\text{Vol} = \pi \int_0^3 (e^{3x})^2 dx \left(= \pi \int_0^3 e^{6x} dx \right)$ $\pi \left[\frac{1}{6} e^{6x} \right]_0^3 = \left(\frac{1}{6} e^{18} - \frac{1}{6} \right) \pi \quad \text{oe}$ | M1 dM1 A1, A1 (4) [4] |
| M1 | Use $\text{Vol} = \pi \int y^2 dx$ Award if pi missing here but reappears later. Limits not needed, ignore any shown. dx may be missing. | |
| dM1 | Square correctly and attempt the integration. $e^{6x} \rightarrow ke^{6x}$ where $k = \pm \frac{1}{6}$ or ± 1 Limits and dx may be missing. Award if pi missing here but reappears later. | |
| A1 | Correct integration including correct limits | |
| A1 | Substitute the limits and obtain the correct answer | |