

**TOPIC**

Mathematics – Section I – Question 6

**QUESTION**The volume generated by rotating  $y = x^3$ ,  $0 \leq x \leq 3$  around the  $x$ -axis is most nearly

(A)  $\pi 3^3$

(B)  $\frac{3^4}{4}$

(C)  $\frac{\pi 3^6}{6}$

(D)  $\frac{\pi 3^7}{7}$

**HINT**A volume element will have an area of  $\pi y^2$ .**SOLUTION**A volume element will have an area of  $\pi y^2$  over a thickness  $dx$ . Hence the volume generated is

$$\begin{aligned}\int_0^3 \pi y^2 dx &= \pi \int_0^3 y^2 dx \\ &= \pi \int_0^3 x^6 dx \\ &= \left(\frac{\pi x^7}{7}\right)_0^3 \\ &= \frac{\pi 3^7}{7}\end{aligned}$$

**ANSWER**

(D)

**CONTRIBUTOR**

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