95. The value of c in Rolle's theorem for the function $f(x) = x^3 - 3x$ in the interval $[0, 3]$ is

(a) 1 (b) -1 (c) $\frac{3}{2}$ (d) $\frac{1}{3}$

Sol. **(a)** We have $f(x) = x^3 - 3x$, which is polynomial function.

So, it is continuous and differentiable.

Also $f(0) = f(3) = 0$

So, there exists atleast one $c \in (0, 3)$, such that

$$f'(c) = 0$$

$$\Rightarrow \quad 3c^2 - 3 = 0$$

$$\Rightarrow \quad c^2 = 1$$

$$\Rightarrow \quad c = 1 \in (0, 3)$$

$$\therefore \quad c = 1$$