Related Questions with Solutions
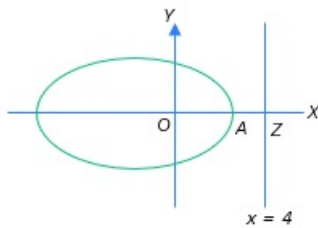

Questions

Quetion: 01

A focus of an ellipse is at the origin. The directrix is the line x = 4 and the eccentricity is $\dfrac{1}{2}$ Then the length of the semi-major axis is

A. $\dfrac{2}{3}$

B. $\dfrac{4}{3}$

C. $\dfrac{16}{3}$

D. $\dfrac{8}{3}$

Solutions

Solution: 01

Focus is O[0, 0] and the directrix is x = 4, which cuts the axis [the axis passes through the focus and is perpendicular to the directrix so, X-axis here] at Z. Then

$$OZ = \dfrac{a}{e} - ae$$

$$\Rightarrow 4 = a\left(2 - \dfrac{1}{2}\right) \Rightarrow a = \dfrac{8}{3}$$

So, the length of the semi-major axis is $\dfrac{8}{3}$

Correct Options

Answer:01

Correct Options: D