Hyperbola - Class XI

Related Questions with Solutions

Questions

Quetion: 01

The equation of hyperbola whose coordinates of the foci are $(\pm 8, 0)$ and the length of the latus rectum is 24 units, is

A. $3x^2 - y^2 = 48$

B. $4x^2 - y^2 = 48$

C. $x^2 - 3y^2 = 48$

D. $x^2 - 4y^2 = 48$

E. q

Solutions

Solution: 01

$\because ae = 8; \dfrac{2b^2}{a} = 24$

$\because \quad b^2 = a^2\left(e^2 - 1\right)$

$\Rightarrow \quad 12a = 64 - a^2 \Rightarrow a^2 + 12a - 64 = 0$

$\Rightarrow (a + 16)(a - 4) = 0 \Rightarrow a = 4 \qquad [\because a \neq -16]$

$\therefore b^2 = 48$

$\therefore$ Required equation of hyperbola is

$\dfrac{x^2}{16} - \dfrac{y^2}{48} = 1 \Rightarrow 3x^2 - y^2 = 48$

Correct Options

Answer:01

Correct Options: A