Past Year JEE Questions

Questions

Quetion: 01

A hyperbola whose transverse axis is along the major axis of the conic, $\frac{x^2}{3} + \frac{y^2}{4} = 4$ and has vertices at the foci of this conic. If the eccentricity of the hyperbola is $\frac{3}{2}$, then which of the following points does **NOT** lie on it ?

A. $(0, 2)$
B. $\left(\sqrt{5}, 2\sqrt{2}\right)$
C. $\left(\sqrt{10}, 2\sqrt{3}\right)$
D. $\left(5, 2\sqrt{3}\right)$

Solutions

Solution: 01

Explanation

$\frac{x^2}{12} + \frac{y^2}{16} = 1$

$e = \sqrt{1 - \frac{12}{16}} = \frac{1}{2}$

Foci $(0, 2)$ & $(0, -2)$

So, transverse axis of hyperbola

$= 2b = 4$

$\Rightarrow b = 2$ & $a^2 = 1^2 (e^2 - 1)$

$\Rightarrow a^2 = 4\left(\frac{9}{4} - 1\right)$

$\Rightarrow a^2 = 5$

$\therefore$ It's equation is $\frac{x^2}{5} - \frac{y^2}{4} = -1$

The point $(5, 2\sqrt{3})$ does not satisfy the above equation.