Conic Section: Ellipse - Class XI

Related Questions with Solutions

Questions

Quetion: 01

The length of the major axis of the ellipse

$(5x-10)^2+(5y+15)^2=\frac{(3x-4y+7)^2}{4}$ is

A. 10

B. $\frac{20}{3}$

C. $\frac{20}{7}$

D. 4

Solutions

Solution: 01

$(5x-10)^2+(5y+15)^2=\frac{(3x-4y+7)^2}{4}$

$\Rightarrow (x-2)^2+(y+3)^2=\left(\frac{1}{2}\frac{3x-4y-7}{5}\right)^2$

$\Rightarrow \sqrt{(x-2)^2+(y+3)^2}=\frac{1}{2}\frac{|3x-4y-7|}{5}$ is an ellipse,

whose focus is [2, –3], directrix 3x – 4y + 7 = 0 and eccentricity is $\frac{1}{2}$

Length of $\perp$ from focus tö directrix is

$\frac{|3\times 2-4(-3)+7|}{5}=5$

$\Rightarrow \quad \frac{a}{e}-ae=5$

$\Rightarrow \quad 2a-\frac{a}{2}=5$

So length of major axis is $\frac{20}{3}$

Correct Options

Answer:01

Correct Options: B