Ellipse

Question1

The length of the latus rectum of $x^2 + 3y^2 = 12$ is

KCET 2025

Options:

A. $\frac{2}{3}$ units

B. $\frac{1}{3}$ units

C. $\frac{4}{\sqrt{3}}$ units

D. 24 units

Answer: C

Solution:

$$\frac{x^2}{12} + \frac{y^2}{4} = 1$$

$$\text{L.R} = \frac{2b^2}{a} = \frac{\cancel{2} \times 4}{\cancel{2}\sqrt{3}} = \frac{4}{\sqrt{3}}$$

Question2

If the area of the ellipse is $\frac{x^2}{25} + \frac{y^2}{\lambda^2} = 1$ is 20π sq units, then λ is

KCET 2021

Options:

A. ± 4

B. ± 3

C. ± 2

D. ± 1

Answer: A

Solution:

Area of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

is $\pi|ab|$

$$a^2=25, b^2=\lambda^2$$

Area of the ellipse $\frac{x^2}{25}+\frac{b^2}{\lambda^2}=1$ is $\pi\times 5\times|\lambda|$.

$\Rightarrow \quad 20\pi=5\pi|\lambda|$

$\Rightarrow \quad |\lambda|=4$

$\Rightarrow \quad \lambda=\pm 4$

Question3

The eccentricity of the ellipse $9x^2+25y^2=225$ is

KCET 2019

Options:

A. $\frac{3}{4}$

B. $\frac{4}{5}$

C. $\frac{9}{16}$

D. $\frac{3}{5}$

Answer: B

Solution:

Given, equation of ellipse $9x^2 + 25y^2 = 225$

$\Rightarrow \quad \frac{x^2}{25} + \frac{y^2}{9} = 1$

Here, $a^2 = 25, b^2 = 9$

Eccentricity, $e = \sqrt{1 - \frac{b^2}{a^2}} = \sqrt{1 - \frac{9}{25}} = \frac{4}{5}$

Question4

The eccentricity of the ellipse $\frac{x^2}{36} + \frac{y^2}{16} = 1$ is

KCET 2017

Options:

A. $\frac{2\sqrt{13}}{6}$

B. $\frac{2\sqrt{5}}{4}$

C. $\frac{2\sqrt{5}}{6}$

D. $\frac{2\sqrt{13}}{4}$

Answer: C

Solution:

We have,

$$\frac{x^2}{36} + \frac{y^2}{16} = 1$$
$$\Rightarrow \frac{x^2}{6^2} + \frac{y^2}{4^2} = 1$$

$\therefore \quad a = 6$ and $b = 4$

Since, $a > b$

$\therefore \quad e = \sqrt{1 - \frac{b^2}{a^2}}$ \$

$$= \sqrt{1 - \frac{(4)^2}{(6)^2}}$$

$$= \sqrt{1 - \frac{16}{36}}$$

$$= \sqrt{\frac{20}{36}}$$

$$= \frac{2\sqrt{5}}{6}$$
