CONIC SECTIONS

ELLIPSE

Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

Q.1 $\frac{x^2}{100}+\frac{y^2}{400}=1$

Q.2 $\frac{x^2}{49}+\frac{y^2}{36}=1$

Q.3 $36x^2+4y^2=144$

Q.4 $4x^2+9y^2=36$

Find the equation for the ellipse that satisfies the given conditions:

Q.5 Vertices $(0, \pm 13)$, foci $(0, \pm 5)$

Q.6 Ends of major axis $(\pm 3, 0)$, ends of minor axis $(0, \pm 2)$

Q.7 $b = 3$, $c = 4$, center at the origin; foci on the x axis

Q.8 Major axis on the x-axis and passes through the points (4,3) and (6,2)

ANSWER KEY

1. F $(0, \pm 10\sqrt{3})$; V $(0, \pm 20)$; Major axis $=40$; Minor axis $= 20$, e $=\frac{\sqrt{3}}{2}$

Latus rectum $= 10$

2. F $(\pm\sqrt{13}, 0)$; V $(\pm 7, 0)$; Major axis $=14$; Minor axis $= 12$, e $=\frac{\sqrt{13}}{7}$, Latus rectum $= \frac{72}{7}$

3. F $(0, \pm 4\sqrt{2})$; V $(0, \pm 6)$; Major axis $=12$; Minor axis $= 4$, e $= \frac{2\sqrt{2}}{3}$, Latus rectum $= \frac{4}{3}$

4. F $(\pm\sqrt{5}, 0)$; V $(\pm 3, 0)$; Major axis $= 6$; Minor axis $= 4$, e $= \frac{\sqrt{5}}{3}$, Latus rectum $= \frac{8}{3}$

5. $\frac{x^2}{144}+\frac{y^2}{169}=1$

6. $\frac{x^2}{9}+\frac{y^2}{4}=1$

7. $\frac{x^2}{25}+\frac{y^2}{9}=1$

8. $x^2+4y^2=52$ or $\frac{x^2}{52}+\frac{y^2}{13}=1$