INDIAN SCHOOL AL WADI AL KABIR
Dept. of Mathematics 2025 – 2026
Class XI – Mathematics
Work Sheet – Conic Sections

1	Find the coordinates of the foci of $y^2 - 16x^2 = 16$.
2	Find the equation of the parabola with vertex at (0, 0) and focus (0, 2).
3	What is the length of the latus rectum of the ellipse $16x^2 + y^2 = 16$?
4	What is the eccentricity of the hyperbola $9y^2 - 4x^2 = 36$?
5	What are the coordinates of the foci of the hyperbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$
6	What is the eccentricity of the hyperbola whose vertices and foci are (±2, 0) and (±3, 0) respectively.
7	Find the equation of the circle passing through the points (2, 3) and (–1, 1) and whose centre lies on the line $x - 3y - 11 = 0$
8	Find the coordinates of the foci, the vertices, the length of major axis, minor axis, the eccentricity and the length of the latus rectum of ellipse $\frac{x^2}{36} + \frac{y^2}{16} = 1$
9	Find the equation of the ellipse satisfying the given conditions: $e = \frac{3}{4}$, foci on y-axis, centre at origin and passing through (6, 4).
10	Find the equation of the circle passing through (0, 0) and making intercepts a and b on the coordinate axes.
11	Find the coordinates of the foci, the vertices, the eccentricity and the length of the latus rectum of the $\frac{x^2}{49} + \frac{y^2}{36} = 1$.
12	Find the coordinates of the foci, the vertices, the eccentricity and the length of the latus rectum of the ellipse $\frac{x^2}{25} + \frac{y^2}{100} = 1$.

13	Find the equation of the hyperbola with foci $(0, \pm 3)$ and vertices $\left(0, \pm \frac{\sqrt{11}}{2}\right)$
14	Find the equation of the hyperbola whose foci are $(\pm 3\sqrt{5}, 0)$ and the length of the latus rectum is 8.
15	Find the equation of the circle which passes through the point (2, –2), (3, 4), and whose centre lies on $x + y = 1$.
16	Find the coordinates of the foci and the vertices, the eccentricity, length of the latus rectum for the hyperbola $16x^2 - 9y^2 = 144$.
17	Find the equation of the circle with centre at (2, –3) and radius 8.
18	Find the equation of the circle with centre (1, 2) and which passes through the point (4, 6).
19	Find the equation of the parabola whose focus is (2, 0) and directrix is $x = -2$.
20	Find the coordinates of a point on the parabola whose $y^2 = 18x$ whose ordinate is equal to the three times of the abscissa.
21	If the parabola $y^2 = 4ax$ passes through the point (9, –12), then find the value of a.
22	Find the eccentricity of the ellipse $\frac{x^2}{100} + \frac{y^2}{400} = 1$.
23	Find the length of the latus rectum for the ellipse $\frac{x^2}{49} + \frac{y^2}{36} = 1$.
24	Find the foci of the hyperbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$.
25	Find the eccentricity of the hyperbola $x^2 - y^2 = 25$.
26	For the hyperbola $16y^2 - 4x^2 = 1$, find the vertices.

Answers

1	$(0, \pm\sqrt{17})$	2	$x^2 = 8y$.
3	Length of the latus rectum $= \frac{2b^2}{4} = \frac{2\times1}{4} = \frac{1}{2}$	4	$e = \frac{c}{a} = \frac{\sqrt{13}}{2}$.
5	the foci are $(\pm c, 0) = (\pm5, 0)$.	6	$e = \frac{3}{2}$
7	$x^2 + y^2 - 7x + 5y - 14 = 0$	8	Coordinates of the foci $(\pm2\sqrt{5}, 0)$ Vertices are (6, 0) and (-6, 0). Length of the major axis 2a = 12 units. length of the minor axis 2b = 2 x 4 = 8 Eccentricity $e = \frac{c}{a} = \frac{2\sqrt{5}}{6} = \frac{\sqrt{5}}{3}$. Length of the latus rectum $= \frac{2\times4^2}{6} = \frac{16}{3}$
9	∴ The required equation of the ellipse is $16x^2 + 7y^2 = 688$.		
10	$x^2 + y^2 - ax - by = 0$		
11	Therefore, the coordinates of the foci are $(c, 0)$ and $(-c, 0)$. *i.e.*, $(\sqrt{13}, 0)$ and $(-\sqrt{13}, 0)$. Vertices are $(a, 0)$ and $(-a, 0)$. *i.e.*, (7, 0) and (–7, 0). Eccentricity $e = \frac{c}{a} = \frac{\sqrt{13}}{7}$. Length of the latus rectum $= \frac{2b^2}{a} = \frac{2\times6^2}{7} = \frac{72}{7}$.	12	The coordinates of the foci are $(0, c)$ and $(0, -c)$ *i.e.*, $(0, 5\sqrt{3})$ and $(0, -5\sqrt{3})$. Vertices are $(0, a)$ and $(0, -a)$ (0, 10) and (0, –10). Eccentricity, $e = \frac{c}{a} = \frac{5\sqrt{3}}{10} = \frac{\sqrt{3}}{2}$. Length of the latus rectum $= \frac{2b^2}{a} = \frac{2\times25}{10} = 5$.
13	$\frac{4y^2}{11} - \frac{4x^2}{25} = 1$	14	$\frac{x^2}{81} + \frac{y^2}{9} = 1$
15	$\frac{x^2}{25} - \frac{y^2}{20} = 1$	16	*Coordinates of the vertices*: The coordinates of the vertices $= (\pm a, 0) = (\pm3, 0)$. *The coordinates of foci*: The coordinates of foci $= (\pm c, 0) = (\pm5, 0)$. $e = \frac{\sqrt{a^2+b^2}}{a} = \frac{\sqrt{9+16}}{3} = \frac{5}{3}$ *The length of the latus rectum*: Length of the latus rectum $= \frac{2b^2}{a} = \frac{2\times16}{3} = \frac{32}{3}$.
17	$x^2 + y^2 - 4x + 6y - 51 = 0$.		
18	$x^2 + y^2 - 2x - 4y - 20 = 0$.		
19	$y^2 = 8x$		
20	the required point is (2, 6).		
21	$a = 4$.	22	$\frac{\sqrt{3}}{2}$

23	$\frac{72}{7}$
25	Eccentricity $e = \frac{c}{a} = \frac{\sqrt{a^2+b^2}}{a}$ $= \frac{\sqrt{25+25}}{5} = \frac{\sqrt{50}}{5} = \frac{5\sqrt{2}}{5} = \sqrt{2}$.

24	foci are $(\pm c, 0) = (\pm 5, 0)$.
26	$(0, \pm a) = \left(0, \pm \frac{1}{4}\right)$