Saitechinfo NEET-JEE Academy

Here's a consolidated table of **important formulas** for **Parabola**, **Ellipse**, **Hyperbola**, and **Circle** along with their standard equations, symbols, and expressions:

Concept	Formula/Expression	Symbols
Circle		
Standard Equation	$x^2 + y^2 = r^2$	r: Radius
General Equation	$x^2 + y^2 + 2gx + 2fy + c = 0$	g, f: Constants
Center	$(-g, -f)$	
Radius	$r = \sqrt{g^2 + f^2 - c}$	
Parabola		
Standard Equation	$y^2 = 4ax$ (opens right), $x^2 = 4ay$ (opens upwards)	a: Distance between vertex and focus
Vertex	$(0, 0)$	
Focus	$(a, 0)$ (right), $(0, a)$ (upward)	
Directrix	$x = -a$ (right), $y = -a$ (upward)	
Latus Rectum Length	$4a$	
Eccentricity	$e = 1$	
Equation of Tangent	At point (x_1, y_1): $yy_1 = 2a(x + x_1)$	
Ellipse		
Standard Equation	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ ($a > b$)	a: Semi-major axis, b: Semi-minor axis
Foci	$(\pm c, 0)$, where $c = \sqrt{a^2 - b^2}$	
Eccentricity	$e = \frac{c}{a}$	$e < 1$
Latus Rectum Length	$\frac{2b^2}{a}$	
Directrices	$x = \pm \frac{a}{e}$	
Equation of Tangent	At point (x_1, y_1): $\frac{xx_1}{a^2} + \frac{yy_1}{b^2} = 1$	
Hyperbola		
Standard Equation	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$	a: Semi-transverse axis, b: Semi-conjugate axis
Foci	$(\pm c, 0)$, where $c = \sqrt{a^2 + b^2}$	
Eccentricity	$e = \frac{c}{a}$	$e > 1$
Latus Rectum Length	$\frac{2b^2}{a}$	
Asymptotes	$y = \pm \frac{b}{a} x$	

Concept	Formula/Expression	Symbols
Directrices	$x = \pm \frac{a}{e}$	
Equation of Tangent	At point (x_1, y_1): $\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 1$	