Maths Formula Sheet

Chapter by chapter, topic by topic. Written by the PadhoNa team for quick revision.

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CHAPTER 27

Hyperbola

Standard hyperbola x²/a² − y²/b² = 1

$$b^2 = a^2(e^2 - 1), \qquad \text{foci } (\pm ae, 0), \qquad \text{latus rectum } \frac{2b^2}{a}, \qquad |SP - S'P| = 2a$$

PARAMETRIC

$$(a\sec\theta,\ b\tan\theta)$$

ASYMPTOTES

$$y = \pm\frac{b}{a}x$$

RECTANGULAR HYPERBOLA

$$a = b,\ e = \sqrt{2}; \qquad xy = c^2 :\ (ct,\ \tfrac{c}{t})$$

CONJUGATE

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = -1; \qquad \frac{1}{e_1^2} + \frac{1}{e_2^2} = 1$$

Tangent, normal and chord

TANGENT

$$\frac{xx_1}{a^2} - \frac{yy_1}{b^2} = 1; \qquad y = mx \pm \sqrt{a^2m^2 - b^2}$$

NORMAL

$$\frac{a^2x}{x_1} + \frac{b^2y}{y_1} = a^2 + b^2$$

DIRECTOR CIRCLE

$$x^2 + y^2 = a^2 - b^2$$

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