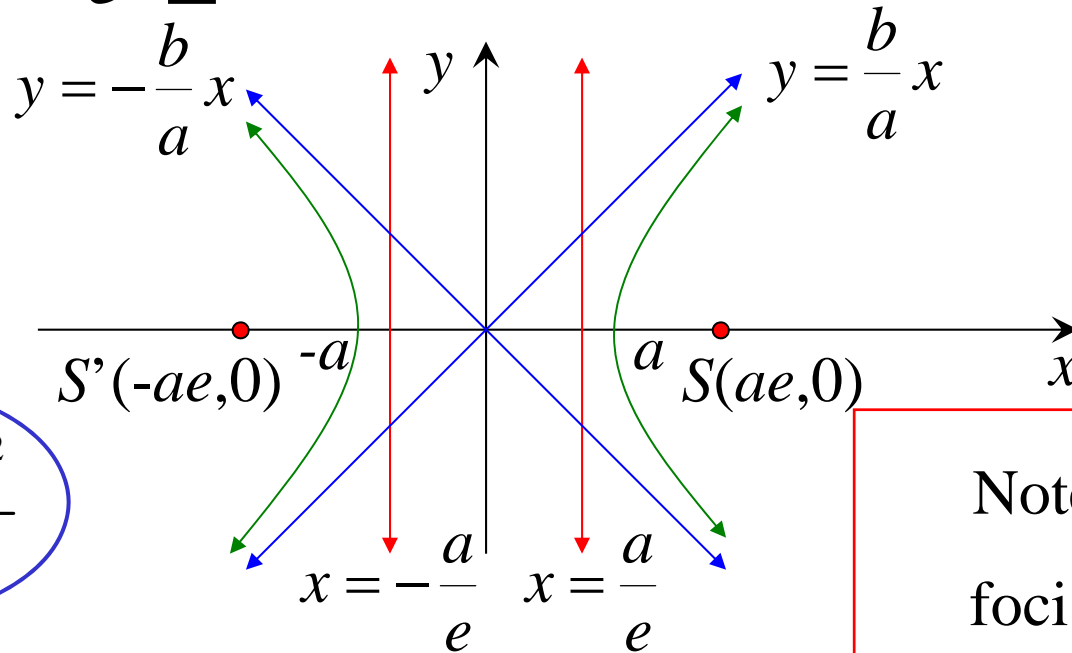


Hyperbola ($e > 1$)



$$e^2 = \frac{a^2 + b^2}{a^2}$$

Note : If $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$
foci on the y axis

$$a^2 = b^2(e^2 - 1)$$

focus : $(0, \pm be)$

directrices : $y = \pm \frac{b}{e}$

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

Hyperbola:

where; $b^2 = a^2(e^2 - 1)$

focus : $(\pm ae, 0)$

directrices : $x = \pm \frac{a}{e}$ asymptotes : $y = \pm \frac{b}{a}x$

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

e.g. Find the eccentricity, foci, directrices and asymptotes of the

hyperbola $\frac{x^2}{9} - \frac{y^2}{16} = 1$

$$a^2 = 9$$

$$a = 3$$

$$e^2 = \frac{a^2 + b^2}{a^2}$$

$$e^2 = \frac{9 + 16}{9}$$

$$e^2 = \frac{25}{9}$$

$$e = \frac{5}{3}$$

$$\therefore \text{eccentricity} = \frac{5}{3}$$

$$\text{foci : } (\pm 5, 0)$$

$$\text{directrices : } x = \pm \frac{9}{5}$$

$$\text{asymptotes : } y = \pm \frac{4}{3}x$$

Patel : Exercise 6B; 1acd, 2, 3