

General equation of a Straight line and its Transformation in Standard forms.

General form of equation of a line is $ax + by + c = 0$, its

(1)**Slope intercept form:** $y = -\frac{a}{b}x - \frac{c}{b}$, slope $m = -\frac{a}{b}$ and intercept on y-axis is, $C = -\frac{c}{b}$

(2)**Intercept form:** $\frac{x}{-c/a} + \frac{y}{-c/b} = 1$, x intercept is $\left(-\frac{c}{a}\right)$ and y intercept is $\left(-\frac{c}{b}\right)$

(3)**Normal form:** To change the general form of a line into normal form, first take c to right hand side and make it positive, then divide the whole equation by $\sqrt{a^2 + b^2}$ like

$$-\frac{ax}{\sqrt{a^2 + b^2}} - \frac{by}{\sqrt{a^2 + b^2}} = \frac{c}{\sqrt{a^2 + b^2}}, \text{ where } \cos \alpha = -\frac{a}{\sqrt{a^2 + b^2}}, \sin \alpha = -\frac{b}{\sqrt{a^2 + b^2}} \text{ and}$$

$$p = \frac{c}{\sqrt{a^2 + b^2}}$$