

## Equation of Straight line through a given point making a given Angle with a given Line.

Since straight line  $L$  makes an angle  $(\theta + \alpha)$  with x-axis, then equation of line  $L$  is  $y - y_1 = \tan(\theta + \alpha)(x - x_1)$  and straight line  $L'$  makes an angle  $(\theta - \alpha)$  with x-axis, then equation of line  $L'$  is

$$\Rightarrow y - y_1 = \tan(\theta - \alpha)(x - x_1)$$

Where  $m = \tan \theta$

Hence, the equation of the straight lines which pass through a given point  $(x_1, y_1)$  and make a given angle  $\alpha$  with given straight line  $y = mx + c$  are

$$y - y_1 = \frac{m \pm \tan \alpha}{1 \mp m \tan \alpha} (x - x_1)$$

