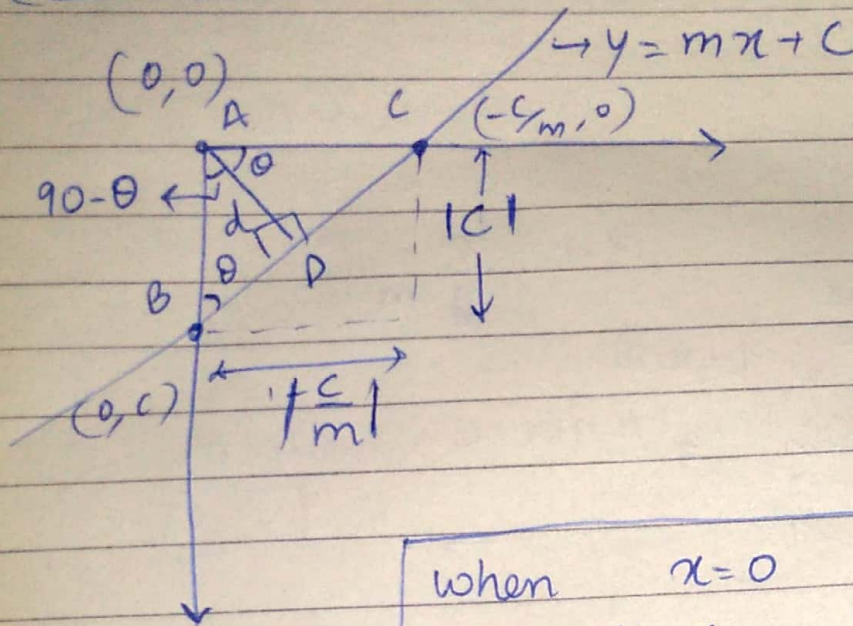


2017276



when $x=0$

$$y=c$$

when

$$y=0$$

$$x = -\frac{c}{m}$$

$$\text{In } \triangle ABD, \sin \theta = \frac{\text{Perpendi}}{\text{Hypoth.}} = \frac{d}{c}$$

$$c = \frac{d}{\sin \theta} = d \csc \theta \quad \text{--- (1)}$$

$$\text{In } \triangle ACD, \cos \theta = \frac{\text{base}}{\text{hypoth}} = \frac{d}{c/m}$$

$$\cos \theta = \frac{d/m}{d \csc \theta}$$

from (1)

$$m = \frac{\cos \theta}{\sin \theta} = \cot \theta \quad \text{--- (2)}$$

Put ① and ② in $y = mx + c$

$$y = \cot(\theta)x + d \sec(\theta)$$

$$y = \frac{x \cos(\theta) + d}{\sin(\theta)}$$

$$y \sin \theta = x \cos(\theta) + d$$
$$\boxed{y \sin \theta - x \cos(\theta) = d}$$

Hence $y = mx + c \Leftrightarrow y \sin(\theta) - x \cos(\theta) = d$

$$m = \cot \theta, \quad c = d \sec(\theta)$$