



Position vector of point 'P' with coordinates (x, y)

$$\vec{r} = (x) \hat{i} + (y) \hat{j}$$

?                    ?

$\therefore$  angle  $\alpha = \tan^{-1} \left( \frac{y}{x} \right)$

$$x = u \cos \theta \times t \quad \text{--- (i)}$$

$$y = u \sin \theta \times t - \frac{1}{2} g t^2 \quad \text{--- (ii)}$$

from equation (i) & (ii), we get  $\Rightarrow$

$$y = x \tan \theta - \frac{g x^2}{(2 u^2 \cos^2 \theta)} \quad \text{--- (iii)}$$

Equation of Trajectory

or  $y = b x + c x^2$

$\hookrightarrow - \frac{g}{(2 u^2 \cos^2 \theta)} \rightarrow \text{constant}$

or  $y = x \tan \theta \left\{ 1 - \frac{x}{R} \right\}$

$\hookrightarrow \text{H.R.} = \frac{u^2 \sin 2\theta}{g}$