PROJECTILE MOTION & VECTORS

Time of flight : $T = \frac{2u\sin\theta}{g}$

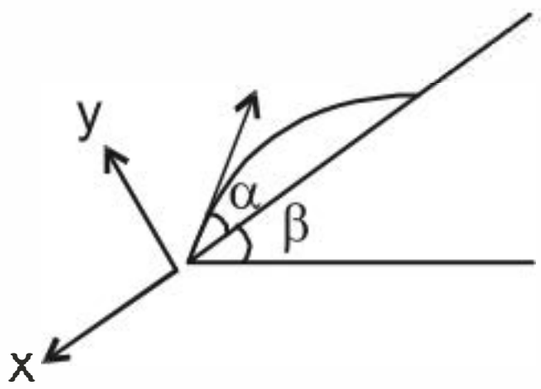
Horizontal range : $R = \frac{u^2 \sin 2\theta}{g}$

Maximum height : $H = \frac{u^2 \sin^2\theta}{2g}$

Trajectory equation (equation of path) :

$$y = x\tan\theta - \frac{gx^2}{2u^2\cos^2\theta} = x\tan\theta\left(1 - \frac{x}{R}\right)$$

Projection on an inclined plane



Range	Up the Incline	Down the Incline
	$\frac{2u^2\sin\alpha\cos(\alpha+\beta)}{g\cos^2\beta}$	$\frac{2u^2\sin\alpha\cos(\alpha-\beta)}{g\cos^2\beta}$
Time of flight	$\frac{2u\sin\alpha}{g\cos\beta}$	$\frac{2u\sin\alpha}{g\cos\beta}$
Angle of projection with incline plane for maximum range	$\frac{\pi}{4}-\frac{\beta}{2}$	$\frac{\pi}{4}+\frac{\beta}{2}$
Maximum Range	$\frac{u^2}{g(1+\sin\beta)}$	$\frac{u^2}{g(1-\sin\beta)}$