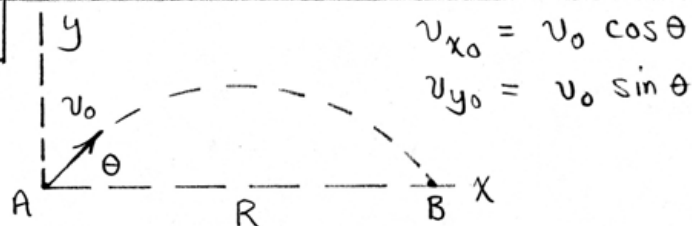


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$$x = x_0 + v_{x0} t \text{ @ B: } R = 0 + (v_0 \cos \theta) t_f \quad (1)$$

$$y = y_0 + v_{y0} t - \frac{1}{2} g t^2 \text{ @ B: } 0 = 0 + (v_0 \sin \theta) t_f - \frac{g}{2} t_f^2$$

$$(2): t_f = 0, \quad \frac{2 v_0 \sin \theta}{g} \quad (t=0 \text{ is launch time})^{(2)}$$

$$(1): R = (v_0 \cos \theta) \left(\frac{2 v_0 \sin \theta}{g} \right) = \frac{v_0^2 \sin 2\theta}{g}$$

$$\frac{dR}{d\theta} = 0: \quad \frac{v_0^2}{g} 2 \cos 2\theta = 0 \Rightarrow \underline{\theta = 45^\circ}$$

$$R_{\max} = \frac{v_0^2 \sin (2 \cdot 45^\circ)}{g} = \underline{\underline{\frac{v_0^2}{g}}}$$