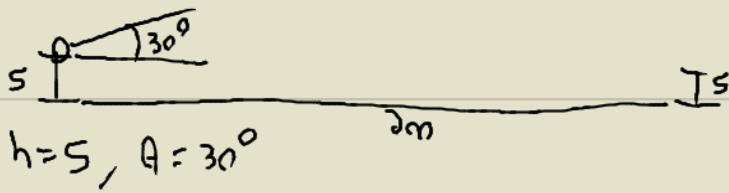


11.

 $V_0 = ?$ 

$$\vec{r}(t) = (V_0 \cos \theta) t \vec{i} + \left[h + V_0 \sin \theta t - \frac{1}{2} g t^2 \right] \vec{j}$$

$$\langle 200, 5 \rangle = (V_0 \cos 30^\circ) t \vec{i} + \left[5 + V_0 \sin 30^\circ t - \frac{1}{2} (30) t^2 \right] \vec{j}$$

$$\langle \underline{200}, \underline{5} \rangle = \underline{\frac{\sqrt{3}}{2} V_0 t} \vec{i} + \underline{\left[5 + V_0 \left(\frac{1}{2} \right) t - 16 t^2 \right]} \vec{j}$$

$$\frac{\sqrt{3}}{2} V_0 t = 200$$

$$\sqrt{3} V_0 t = 400$$

$$t = \frac{400}{\sqrt{3} V_0}$$

$$\underline{5} = \underline{5} + V_0 \left(\frac{1}{2} \right) t - 16 t^2$$

$$0 = \frac{1}{2} V_0 t - 16 t^2$$

$$0 = \frac{1}{2} V_0 \left(\frac{400}{\sqrt{3} V_0} \right) - 16 \left(\frac{400}{\sqrt{3} V_0} \right)^2$$

$$0 = \frac{200}{\sqrt{3}} - 16 \left(\frac{160000}{3 V_0^2} \right)$$

$$16 \left(\frac{160000}{3 V_0^2} \right) = \frac{200}{\sqrt{3}}$$

$$\frac{2560000}{3 V_0^2} = \frac{200}{\sqrt{3}}$$

$$3 V_0^2 (200) = \sqrt{3} \cdot 2560000$$

$$600 V_0^2 = 2560000 \sqrt{3}$$

$$V_0^2 = \frac{2560000}{600} \sqrt{3}$$

$$V_0^2 = \frac{1080}{3} \sqrt{3}$$

$$V_0 = \sqrt{\frac{1080 \sqrt{3}}{3}}$$