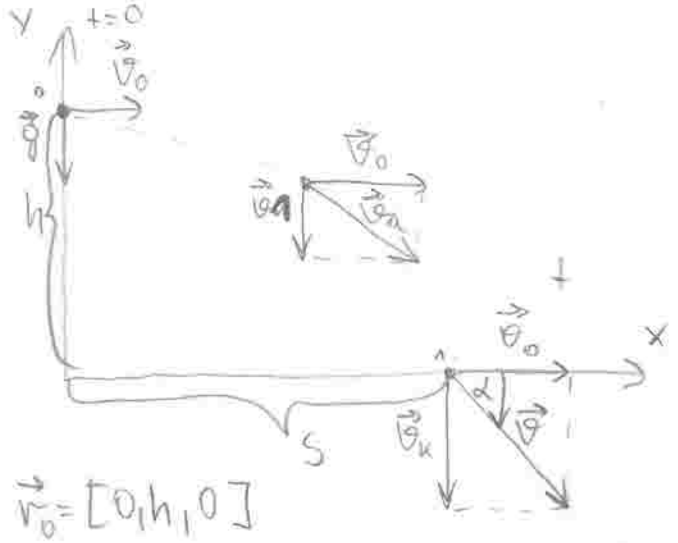

$\vec{r}_0 = [0, h, 0]$

$\vec{r}_1 = [s, 0, 0]$

$h = \frac{gt^2}{2}$

$s = v_0 \cdot t$

$v_0 = const$

$v_k = 0 + g \cdot t$

$v_k = g \cdot t$

$v_0 = g \cdot t$

$t = \frac{v_0}{g}$

$s = v_0 \cdot t$

$s = v_0 \cdot \frac{v_0}{g}$

$s = \frac{v_0^2}{g} \quad \left[\frac{m}{s} \cdot \frac{m}{s} \cdot \frac{s^2}{m} \right] = [m]$

$\boxed{s = \frac{v_0^2}{g}}$ – Range of throw

$\pi = 180^\circ$

$\alpha = -\frac{\pi}{4}$

$\alpha = -45^\circ$

$\vec{v} = \vec{v}_0 + \vec{v}_k$

$\frac{v_0}{v} = \cos\alpha$

$\cos 45^\circ = \frac{1}{\sqrt{2}}$

$v = v_0 \cdot \frac{1}{\cos\alpha}$

$\frac{v_k}{v} = \sin\alpha$

$v = v_k \cdot \frac{1}{\sin\alpha}$

$v = \sqrt{2} \cdot v_0$

$v = \sqrt{2} \cdot v_k$

$\sqrt{2} \cdot v_0 = \sqrt{2} \cdot v_k$

$v_0 = v_k$

$x = v_0 \cdot t$

$y = h - \frac{gt^2}{2}$

$$\begin{cases} x = v_0 \cdot t \\ y = h - \frac{gt^2}{2} \end{cases}$$

$$\begin{cases} x^2 = v_0^2 \cdot t^2 \\ y = h - \frac{gt^2}{2} \end{cases}$$

$$\begin{cases} t^2 = \frac{x^2}{v_0^2} \\ \frac{gt^2}{2} = h - y \quad / \cdot 2 \quad / : g \end{cases}$$

$$\begin{cases} t^2 = \frac{x^2}{v_0^2} \\ t^2 = \frac{2(h-y)}{g} \end{cases}$$

$$\frac{2(h-y)}{g} = \frac{x^2}{v_0^2} \quad / \cdot g$$

$$2h - 2y = \frac{x^2}{v_0^2} \cdot g \quad / : 2$$

$$h - y = \frac{x^2}{2v_0^2} \cdot g$$

$$\underline{y = h - \frac{x^2}{2v_0^2} \cdot g}$$ the trajectory equation