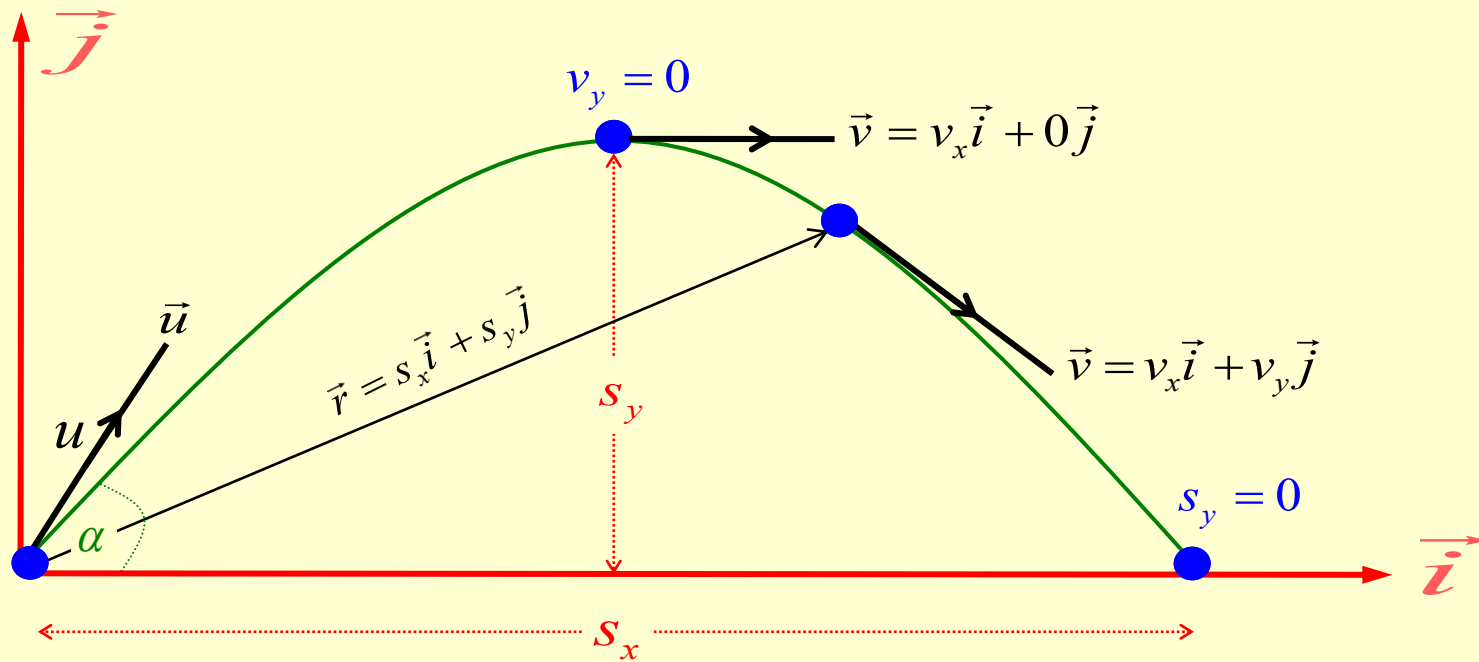


PROJECTILES ON A HORIZONTAL PLANE



Equations:

$$u_x = u \cos \alpha$$

$$u_y = u \sin \alpha$$

$$v_x = u_x$$

$$v_y = u_y - gt$$

$$s_x = u_x t$$

$$s_y = u_y t - \frac{1}{2} gt^2$$

Initial velocity vector:

$$\vec{u} = u \cos \alpha \vec{i} + u \sin \alpha \vec{j}$$

Range:

Find s_x when $s_y = 0$

Max Height:

Find s_y when $v_y = 0$

Velocity vector:

$$\vec{v} = v_x \vec{i} + v_y \vec{j}$$

Position vector:

$$\vec{r} = s_x \vec{i} + s_y \vec{j}$$

Speed:

$$|\vec{v}| = \sqrt{(v_x)^2 + (v_y)^2}$$

Distance:

$$|\vec{r}| = \sqrt{(s_x)^2 + (s_y)^2}$$