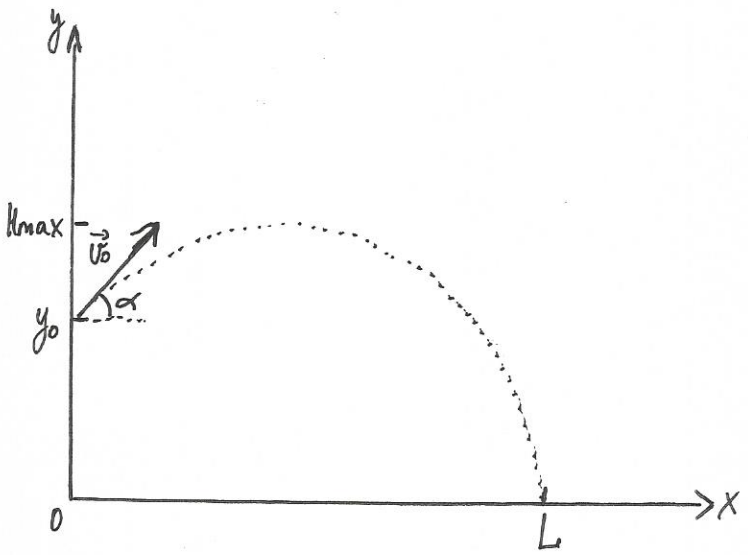

$$y(t) = y_0 + V_0 \cdot \sin\alpha \cdot t - \frac{gt^2}{2}$$

$$x(t) = V_0 \cdot \cos\alpha \cdot t$$

$$V_y(t) = V_0 \cdot \sin\alpha - gt$$

$$V_x(t) = V_0 \cdot \cos\alpha$$

$$t_{под} = \frac{V_0 \cdot \sin\alpha}{g} \quad (V_y(t_{под}) = 0)$$

$$H_{max} = y_0 + \frac{V_0^2 \cdot \sin^2\alpha}{2g} \quad (y(t_{под}) = H_{max})$$

$$t_{пол} = \frac{V_0 \cdot \sin\alpha + \sqrt{V_0^2 \cdot \sin^2\alpha + 2y_0 \cdot g}}{g} \quad (y(t_{пол}) = 0)$$

$$L = V_0 \cdot \cos\alpha \cdot t_{пол}$$

$$V_{кx} = V_0 \cdot \cos\alpha$$

$$V_{кy} = V_0 \cdot \sin\alpha - g \cdot t_{пол}$$

$$V_к = \sqrt{V_{кx}^2 + V_{кy}^2}$$

$$\beta = \operatorname{arctg}\left(\frac{V_{кy}}{V_{кx}}\right)$$

Уравнение траектории:

$$y(x) = y_0 + x \cdot \operatorname{tg}\alpha - \frac{gx^2}{2V_0^2 \cdot \cos^2\alpha}$$