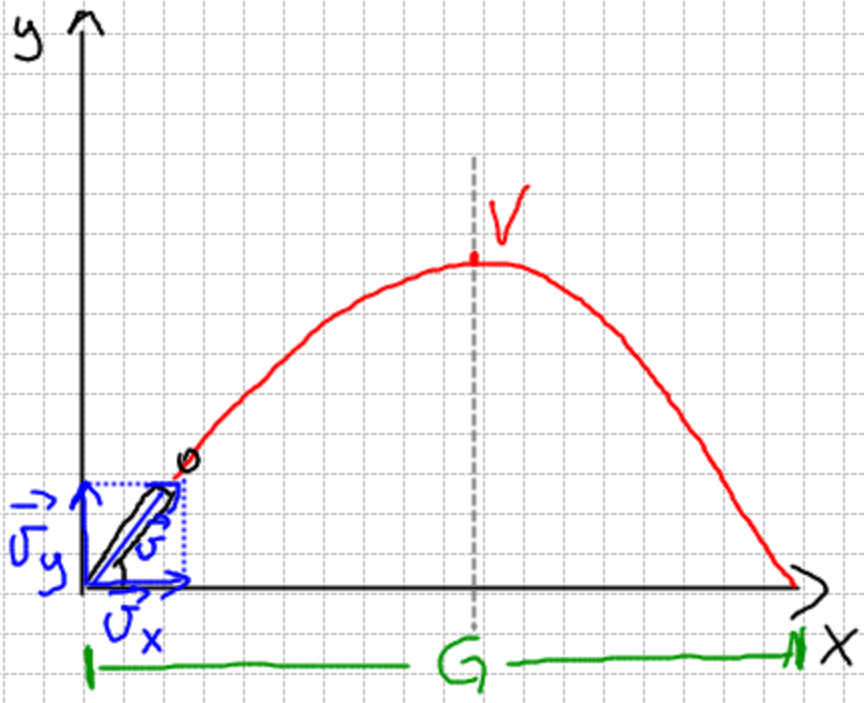
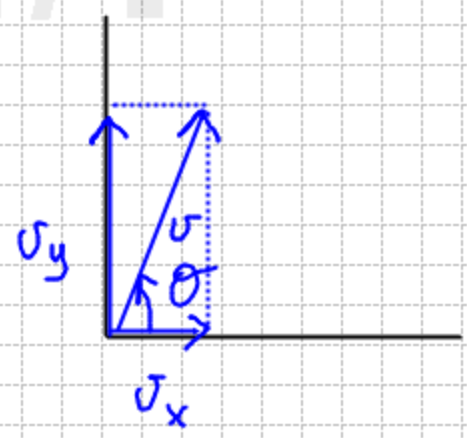
MOTO DI UN PROIETTILE





$$\begin{cases} x = v_x t \\ y = v_y t - \frac{1}{2} g t^2 \end{cases}$$

$$\boxed{\begin{aligned} v_x &= v \cos\vartheta \\ v_y &= v \operatorname{sen}\vartheta \end{aligned}}$$

$$\begin{cases} x = v\cos\vartheta\, t \\ y = v\operatorname{sen}\vartheta\, t - \frac{1}{2} g t^2 \end{cases} \quad \begin{cases} t = \dfrac{x}{v\cos\vartheta} \\ y = v\operatorname{sen}\vartheta \cdot \dfrac{x}{v\cos\vartheta} - \dfrac{1}{2} g \dfrac{x^2}{v^2\cos^2\vartheta} \end{cases}$$

$$\begin{cases} y = \dfrac{\operatorname{sen}\vartheta}{\cos\vartheta} x - \dfrac{g}{2v^2\cos^2\vartheta} x^2 \\ t = \dfrac{x}{v\cos\vartheta} \end{cases}$$

$$\boxed{\operatorname{tg}\vartheta = \frac{\operatorname{sen}\vartheta}{\cos\vartheta} = \frac{v_y}{v_x}}$$

$$\begin{cases} y = \operatorname{tg}\vartheta\, x - \dfrac{g}{2v^2\cos^2\vartheta} x^2 \\ t = \dfrac{x}{v\cos\vartheta} \end{cases}$$

Per trovare la gittata G metto a sistema l'equazione del moto (parabola) con la retta $y = 0$:

$$\begin{cases} y = \operatorname{tg}\vartheta\, x - \dfrac{g}{2v^2\cos^2\vartheta} x^2 \\ y = 0 \end{cases} \quad \begin{cases} -\dfrac{g}{2v^2\cos^2\vartheta} x^2 + \operatorname{tg}\vartheta\, x = 0 \\ y = 0 \end{cases}$$

$$\begin{cases} x\left[-\dfrac{g}{2v^2\cos^2\vartheta} x + \operatorname{tg}\vartheta \right] = 0 \\ y = 0 \end{cases} \rightarrow \begin{cases} x = 0 \\ y = 0 \end{cases} \quad \begin{cases} x = \dfrac{\operatorname{tg}\vartheta\, 2v^2\cos^2\vartheta}{g} \\ y = 0 \end{cases}$$

$$\begin{cases} x = \dfrac{v_y}{v_x} \cdot 2v_x \\ y = 0 \end{cases} \quad \boxed{x = \frac{2 v_x v_y}{g}} \quad \text{gittata G}$$

$$\boxed{y = \frac{v_y}{v_x} x - \frac{g}{2v_x^2} x^2}$$

equazione del moto