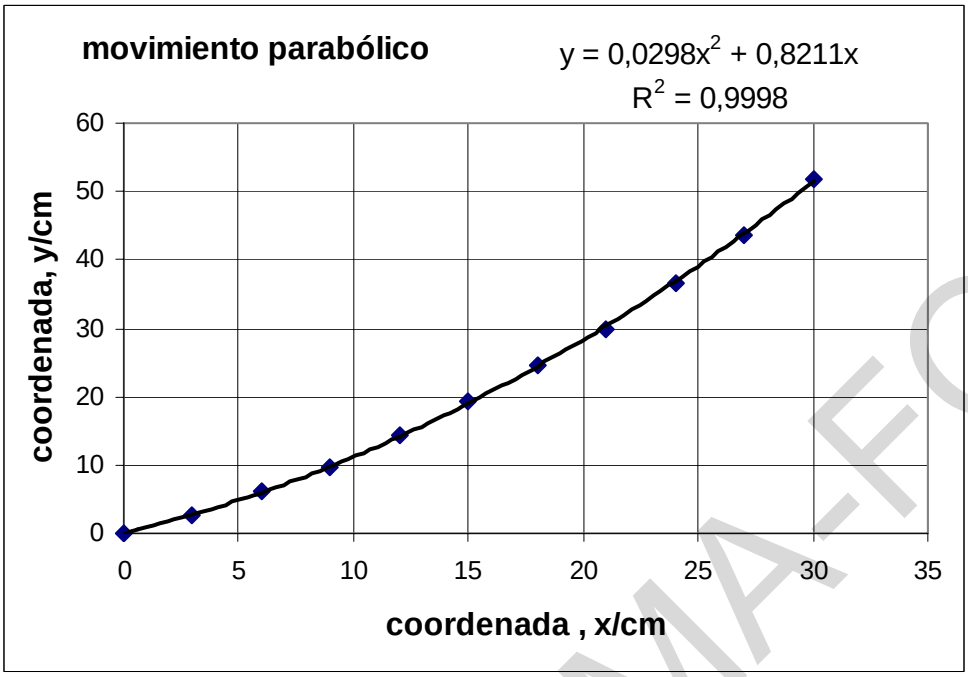
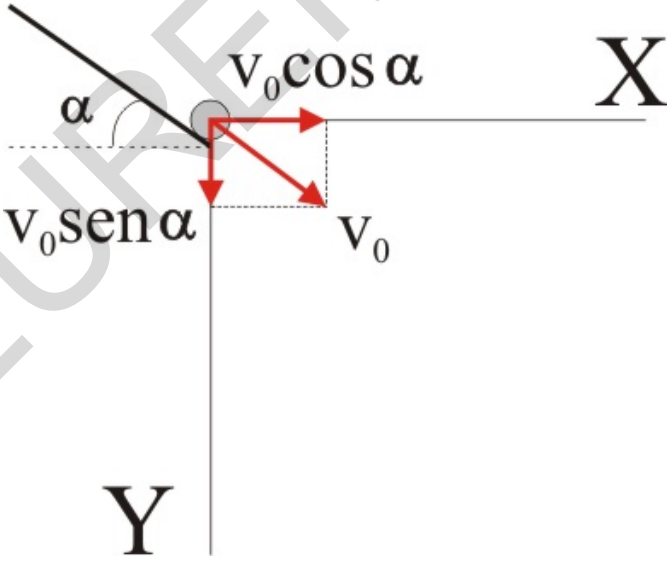
Movimiento parabólico (solucionario)

1)



2) Ecuación de la parábola



$$\left.\begin{aligned} y &= v_o \operatorname{sen}\alpha \; t + \frac{1}{2} g t^2 \\ x &= v_o \cos\alpha \; t \end{aligned}\right\} \qquad y = v_o \operatorname{sen}\alpha \; \frac{x}{v_o \cos\alpha} + \frac{1}{2} g \frac{x^2}{v_o^2 \cos^2\alpha} \quad \Rightarrow$$

$$\Rightarrow \quad y = x \; \operatorname{tag}\alpha + \frac{1}{2} g \frac{x^2}{v_o^2 \cos^2\alpha}$$

3)

$$y = 0{,}0298\ x^2 + 0{,}8211\ x$$

$$tag\ \alpha = 0{,}8211 \quad \Rightarrow \quad \alpha = 39{,}4^{\circ}$$

$$0{,}0298 = \frac{g}{2v_o^2\cos^2\alpha} \Rightarrow v_o = \sqrt{\frac{g}{2*\cos^2\alpha*0{,}0298}} = \sqrt{\frac{981}{2*\cos^2 39{,}4*0{,}0298}} = 166\frac{cm}{s^2} = 1{,}7\frac{m}{s^2}$$

4) Supondremos que únicamente la bola desliza por el plano.

$$\frac{1}{2}mv_o^2 = mgLsen\alpha \Rightarrow v_o = \sqrt{2gLsen\alpha} = \sqrt{2*981*29{,}7*sen40} = 194\frac{cm}{s^2} = 1{,}9\frac{m}{s^2}$$