

Meta no 5: "Procuro vivir la coherencia de vida"

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Hoja de trabajo #5: Movimiento de Projectiles.

1. Datos

$$y_f = 2m$$

$$y_0 = h = 20m$$

$$x = 55m$$

$$g = -9.8 \text{ m/s}^2$$

$$V_{0x} = ?$$

$$V_{0y} = 0 \text{ m/s}$$

$$V_{0x} = \frac{x}{t} = \frac{55m}{1.92s} = 28.65 \text{ m/s}$$

$$y_f - y_0 = V_{0y}t - \frac{1}{2}gt^2$$

$$-18m = -\frac{1}{2}gt^2$$

$$-18 = -4.9t^2$$

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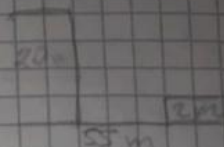
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$$V_{0x} = 28.65 \text{ m/s}$$

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2.

$$V_{fy} = V_{0y} - gt$$

$$V_{fy} = -9.8(1.92 \text{ seg}) = -18.82 \text{ m/s}$$

$$V_{fx} = 28.65 \text{ m/s}$$

$$V = \sqrt{28.65^2 + (-18.82 \text{ m/s})^2}$$

$$V = 34.28 \text{ m/s}$$

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3.

$$y_f = -40m$$

$$x = 30$$

$$V_0 = 343 \text{ m/s}$$

$$V_0 = ?$$

$$t = 3 \text{ seg} + t_{\text{segundo}}$$

$$y_f - y_0 = V_{0y}t - \frac{1}{2}gt^2$$

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$$t = \frac{2(-40)}{-9.8} = t = 2.86 \text{ s}$$

$$t = 3 \text{ seg} - 2.86 \text{ seg} = 0.14 \text{ s}$$

$$d = V_i t$$

$$d = (343 \text{ m/s})(0.4 \text{ seg}) = 137.2 \text{ m}$$

$$d^2 = x^2 + y^2 - 2xy \cos \theta$$

$$x = \sqrt{d^2 - y^2} = \sqrt{137.2^2 - 140^2} = 26.5 \text{ m}$$

$$x = V_{x1} t + \text{calculus}$$

$$V_{x1} = 9.28 \text{ m/s}$$

$$V_{x1} = \frac{x}{t} = \frac{26.5 \text{ m}}{2.86 \text{ s}} = 9.28 \text{ m/s}$$

4. Datos

$$x = 90 \text{ m}$$

$$h = 50 \text{ m}$$

$$t = \frac{2(-50)}{-9.8}$$

$$t = \frac{2(-100)}{-9.8}$$

$$t = 3.19 \text{ seg}$$

$$V_0 = \frac{x}{t}$$

$$V_0 = 28.21 \text{ m/s}$$

$$V_0 = 90 \text{ m}$$

$$V_0 = 28.21$$

5. Datos

$$h = 200 \text{ m}$$

$$g = -9.8 \text{ m/s}^2$$

$$t = \frac{2(200)}{-9.8}$$

$$t = 6.39 \text{ seg}$$

6. Datos

$$V_0 = 180 \text{ km/h}$$

$$t = 6.39$$

$$x = V_0 t$$

$$x = 180 \cdot 6.39$$

$$x = 1150.2$$

$$x = 1150.2 \text{ m}$$

7. Datos

$$x = 4 \text{ m/s } t$$

$$y = 10 - \frac{1}{2} \cdot 9.8 \text{ m/s}^2 \cdot t^2 = 0$$

$$t = \frac{\sqrt{2 \cdot 10}}{9.8} = 1.43 \text{ seg}$$

$$x = 4 \cdot 1.43 = 5.72 \text{ m}$$

$$t = \sqrt{\frac{2 \cdot 5}{9.8}} = 1.01 \text{ seg} \quad V_2 = 5.66 \text{ m/s}$$

$$V = \frac{5.72 \text{ m}}{1.01 \text{ s}} = 5.66 \text{ m/s}$$

8. Datos

$$40 = 25 \cdot t$$

$$y = 12.54 \text{ m}$$

$$t = 1.60 \text{ s}$$

$$y = \frac{1}{2} g t^2$$

$$y = \frac{1}{2} \cdot 9.8 \cdot (1.60)^2$$

$$y = 12.54 \text{ m}$$

9.

$$V_x = 30\sqrt{2} \text{ m/s} \cdot \cos 45^\circ = 30.00 \text{ m/s}$$

$$V_y = V_1 \cdot \cos 53^\circ = 30 \text{ m/s}$$

$$V_1 = \frac{(30 \text{ m/s})}{\cos 53^\circ} = 49.85 \text{ m/s}$$

$$h = \frac{(49.85)^2 - (30\sqrt{2})^2}{2 \cdot 9.8} = 34.95 \text{ m}$$

$$586.32 - 1080 = 34.95 \text{ m}$$

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Datos

$$v_x = 20 \text{ m/s} = 20^2$$

$$\theta = 33^\circ$$

$$g = -9.8$$

$$y = v_y \sin 33^\circ - \frac{1}{2} \cdot 9.8 \cdot t^2$$

$$x = v_x \cos 33^\circ = 0.80 x_1$$

$$0.80 x = 20 t$$

$$0 = 0_1$$

$$x = v_0 \cdot t$$

$$x = 20 t$$

$$0.8 x = 20 t$$

$$0 = 0.16 x - 4.9 t^2$$

$$0.16 x = -4.9 t^2$$

$$\frac{0.16 x}{0.8 x} = \frac{-4.9 t^2}{20 t}$$

$$0.75 = 0.25 t$$

$$t = 3.00 \text{ s}$$

$$0.8 x = 20 \cdot 3$$

$$x = \frac{60}{0.80}$$

$$x = 75.00$$