Meta no5: "Procuro vivir la coherencia de vida"

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Hoja de trabajo #5: Movimiento de Proyectiles.

1. Datos
$y_f = 2m$
$y_o = h = 20m$
$x = 55m$
$g = -9.8 m/s^2$
$V_{ox} = ?$
$V_{oy} = 0 m/s$

$y_f - y_o = V_{oy}t - \frac{1}{2}gt^2$

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

$-18 = -4.9t^2$

$\frac{-18}{-4.9} = t^2$

$\sqrt{3.67} = \sqrt{t^2}$

$t = 1.92$ seg.

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

$V_{ox} = 28.65 m/s$

2.

$V_{fy} = V_{oy} - gt$

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

$V_{fx} = 28.65 m/s$

$V = \sqrt{(28.65)^2 + (-18.82)^2}$

$V = 34.28 m/s$

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3. Datos
$y_f = -40 m$
$t_f = 3s$
$V_o = 343 m/s$
$V_o = ?$

$t = \sqrt{\frac{2(-40)}{-9.8}}$

$t = 2.86 s$

$t = 3 seg - 2.86 seg = 0.14 s.$

$d = V_x \cdot t$

$d = (343\ m/s)(0.14\ seg) = 48.02\ m$

$d^2 = x^2 + y^2 \rightarrow x = \sqrt{d^2 - y^2}$

$x = \sqrt{48.02^2 - (40)^2} = 26.57\ m$

$x = V_{x1} \cdot t$ calcular

$V_{x1} = \frac{x}{t} = \frac{26.57\ m}{2.86\ s} = 9.28\ m/s$ $\quad V_{x1} = 9.28\ m/s$

4. Datos

$x = 90\ m$

$h = 50\ m$

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

$t = \sqrt{\frac{-100}{-9.8}}$

$t = 3.19\ seg$

$V_0 = \frac{x}{t}$ $\quad V_0 = 28.21\ m/s$

$V_0 = \frac{90\ m}{3.16\ s}$

$V_0 = 28.21$

5. Datos

$h = 200\ m$

$g = -9.8\ m/s^2$

$t = \sqrt{\frac{2(200)}{-9.8}} = 6.39\ seg.$

$t = 6.39\ seg.$

6. Datos

$V = 180\ km/h$

$t = 6.39$

$x = V \cdot t$

$x = 50 \cdot 6.39$

$x = 319.50$

$x = 319.50\ m$

7. Datos

$x = 4\ m/s\ t$

$y = 10 + 1/2 - 9.8\ m/s^2\ t^2 = 0$

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

$x = 4 \cdot 1.43 = 5.72\ m$

$t = \sqrt{\frac{2.5}{9.8}} = 1.01\ seg$ $\quad V_2 < 5.66\ m/s.$

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

8. Datos

$40 = 25 \cdot t$ $\quad y = 12.54\ m$

$t = 1.60\ s$

$y = y_0 + v_0 t + \frac{1}{2} g t^2$

$y = 12 + 40(1.60) - \frac{1}{2}(9.8)(1.60)^2$

$y = 12.54$

9.

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

$V_x = V_1 \cdot \cos 53 = 30\ m/s$

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

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

$586.32 - 1800 = 34.95\ m$

Ardmany.

i0) Datos

$v_x = 20$ m/s $= 20^*$

$\theta = 37^\circ$

$g = -9.8$

$y = x \operatorname{sen} 37^\circ - 1/2 \cdot 9.8 t^2$

$x = x \cos 37^\circ = 0.80x$

$0.80x = 20t$

$0 = 0$

$x = v_0 \cdot t$

$x = 20t$

$0.8x = 20 \cdot 3$

$x = \frac{60}{0.80}$ $\quad x = 75.00$

$0.8x = 20t$

$0 = 0.6x - 4.9t^2$

$0.6x = -4.9t^2$

$\frac{0.6x}{0.8x} = \frac{-4.9t^2}{20t}$

$0.75 = 0.25t$

$t = 3.00$ s