

Meta #3: "Procuro vivir los buenos modales"
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Movimiento acelerado (Caída libre): Hoja de trabajo #3

1) Datos

$$\begin{aligned} V_0 &= 25 \text{ m/s} \\ V_f &= 40 \text{ m/s} \\ g &= -9.8 \text{ m/s}^2 \\ t &= ? \end{aligned}$$

$$t = \frac{V_f - V_0}{g} \quad t = \frac{15}{-9.8}$$

$$t = \frac{40 - 25}{-9.8} \quad t = 1.53 \quad t = 1.53 \text{ s}$$

2)

$$\begin{aligned} V_0 &= 25 \text{ m/s} \\ V_f &= 40 \text{ m/s} \\ g &= -9.8 \text{ m/s}^2 \\ t &= 1.53 \end{aligned}$$

$$\Delta y = \left(\frac{V_0 + V_f}{2} \right) t$$

$$\Delta y = \left(\frac{25 \text{ m/s} + 40 \text{ m/s}}{2} \right) 1.53$$

$$\Delta y = (32.5) 1.53$$

$$\Delta y = 49.7 \text{ m} \quad y = 49.7 \text{ m}$$

3) Datos

$$\begin{aligned} V_0 &= 40 \text{ m/s} \\ t &= 6 \text{ s} \\ V_f &= ? \\ g &= -9.8 \text{ m/s}^2 \end{aligned}$$

$$V_f = 40 + 9.8 \cdot 6$$

$$V_f = -98.8$$

$$V_f = -98.8 \text{ m/s}$$

4) Datos

$$\begin{aligned} V_0 &= 0 \text{ m/s} \\ V_f &= ? \\ t &= ? \\ y &= 17.6 \text{ m} \\ &= 0.176 \end{aligned}$$

$$t = \sqrt{\frac{2(h)}{g}}$$

$$t = 0.19 \text{ s}$$

$$t = \sqrt{\frac{2(0.176)}{9.8}}$$

$$t = 0.19 \text{ s}$$

$$t = 0.0359$$

5) Datos
 $V_0 = 0 \text{ m/s}$
 $y_f = -56.67 \text{ m}$
 $g = -9.8$

$$t = \sqrt{\frac{2 \cdot (-56.67)}{-9.8}} \quad t = 3.40 \text{ s}$$

$$t = 3.40 \text{ s}$$

6) Datos

$$V_0 = 0 \text{ m/s}$$

$$V_f = -56.67$$

$$g = -9.8$$

$$t = 3.40$$

$$V_f =$$

$$V_f = 0 + (-9.8)(3.40)$$

$$V_f = -33.32$$

$$V_f = -33.32 \text{ m/s}$$

7) Datos

$$V_0 = 5 \text{ m/s}$$

$$V_f = ?$$

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

$$t = ?$$

$$y = 60$$

$$t = \sqrt{\frac{2(40)}{9.8}} \quad t = \sqrt{\frac{-120}{-9.8}}$$

$$t = \sqrt{\frac{2(-60)}{-9.8}} \quad t = 3.5 \text{ s}$$

$$V_f = V_0 + g \cdot t \quad V_f = -39.3$$

$$V_f = 5 + (-9.8)(3.5) \quad V_f = -39.3$$

8) Datos

$$t = 3.5 \text{ s}$$

$$V_f = 50 \text{ m/s}$$

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

$$-50 = V_0 + (-9.8)(3.5)$$

$$-50 = V_0 - 34.3 \quad V_0 = -15.7 \text{ m/s}$$

$$-50 + 34.3 = V_0$$

$$V_0 = -15.7$$

9) Datos

$$t = 3.5 \text{ s}$$

$$V_f = 50 \text{ m/s}$$

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

$$y = ?$$

$$V_0 = -15.7$$

$$y = \frac{(-15.7 + -50)t}{2} \quad y = -114.98$$

$$y = \left(\frac{-65.7}{2} \right) 3.5 \quad y = -114.98 \text{ m}$$

$$y = -32.85 \cdot 3.5$$

10).

$$y = \cancel{v_0} t + v_f t - \frac{1}{2} g t^2$$

$$y = v_f (0.10) - \frac{1}{2} (9.8) (0.10)^2$$

$$6 = 0.10 v_f - 0.049 \quad 6 + 0.049 = 0.10 v_f$$

$$v_f = \frac{6.049 \text{ m}}{0.1 \text{ Sec}} = 60.49 \text{ m/s}$$

$$v_2^2 = v_0^2 + 2g(y_2 - y_0)$$

$$h = 186.74 \text{ m}$$

$$y = \frac{v_0^2}{2g} - \frac{v_f^2}{2g} = \frac{60.49^2}{2(9.8)} - \frac{6^2}{2(9.8)} = 1$$