

10-03-2021

Meta no. 8: "Profundiza en el sentido de la libertad"  
Pablo Javier Alemán Velásquez, carné 2019222, PSEBV

## EXAMEN 1 BIM

1. Datos

$$V_f = 22 \text{ m/s}$$

$$h = 38 \text{ m}$$

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

$$V_f^2 = V_0^2 + 2gh$$

$$22^2 = V_0^2 + 2(-9.8)$$

$$2(-9.8)(-38) = 22^2 - V_0^2$$

$$749.8 = 22^2 - V_0^2$$

$$749.8 - 484 = V_0^2 \quad V_0 = 16.15 \text{ m/s}$$

2. Datos

$$V_0 = 28 \text{ m/s}$$

$$h = 17$$

$$g = -9.8$$

$$y_f - y_i = V_{0y}t + \frac{1}{2}(-9.8)t^2$$

$$17 = 28t - 4.9t^2$$

$$-4.9t^2 + 28t - 17 = 0$$

$$t = 5.02 \text{ segundos}$$

3. Datos

$$V_0 = 0$$

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

$$h = ?$$

$$V_f = 56 \text{ m/s}$$

$$\frac{-56 - 0}{-9.8} = 5.715 \text{ s}$$

$$\frac{56^2 + 0^2}{-19.6} = 160$$

$$-19.60$$

$$h = 160 \text{ m}$$



4. Untuk

$$y_0 = 119 \text{ m}$$

$$v_0 = 17 \text{ m/s}$$

$$g = -9.8$$

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

$$0 - 119 = 17t + \frac{1}{2}(-9.8)t^2$$

$$-119 = 17t - 4.9t^2$$

$$0 = -4.9t^2 + 17t - 119$$

$$t = 6.96 \quad t = 6.96$$

5.

$$x = 102$$

$$\theta = 43^\circ$$

$$v_0 = \frac{g \cdot t}{2 \cdot \sin 43}$$

$$102 = v_x \cdot t$$

$$102 = \left( \frac{g \cdot t}{2 \cdot \sin 43} \cdot \sin 43 \right) (t)$$

$$\frac{102}{t}$$

$$102 = \left( \frac{9.8t^2}{2 \cdot 1.36} \cdot 1.36 \right) (t)$$

$$102 = v_x \cdot 10.41$$

$$102 =$$

$$t = 10.41$$

$v_x$

$$9.80 = v_0 \cdot \cos 43^\circ$$

$$v_0 = 13.40$$

$$102 = v_x \cdot 10.41$$

$$v_x = 9.8$$

$$9.80 = v \cdot \cos 43$$

$$13.40$$

$$6. \quad y_f - y_0 = v_{0y}t + \frac{1}{2}gt^2$$

$$0 - 23 = 10t - 4.9t^2 \quad t = 3.47$$

$$-23 = 10t - 4.9t^2$$

$$0 = -4.9t^2 + 10t + 23$$

$$x = v \cdot t \quad x = 34.20$$

$$x = 10 \cdot 3.47$$

$$7. \quad x = 11 \quad x = v \cdot t \quad t = 1.833$$

$$v = 6 \quad 11 = 6 \cdot t$$

$$t = t$$

$$y_f = \frac{1}{2}gt^2$$

$$y_f = 0.5(9.8)(1.833)^2 = 16.4 \text{ m}$$

$$h = 16.41$$

$$8. \quad x = 20 \text{ m} \quad V = \sqrt{\frac{9.8(20)^2}{2(20)\tan(51) - 3})\cos^2(51)}}$$

$$n = 3$$

$$\theta = 51$$

$$V = \sqrt{\frac{3,920}{40.40}}$$

$$V = \sqrt{\frac{3,920}{18.38}}$$

$$V = 14.60 \text{ m/s}$$

$$V = 14.60$$



9.  $v_0 = 80$   
 $\theta = 59$

10.  $V = 13 \text{ m/s}$   
 $h = 25$   
 $h = 1$   
 $x = 15$

$1 - 25 = 12 g \cdot t^2$   
 $-24 = -4.9 t^2$   
 $0 = -4.9 t^2 + 24$   
 $t = 2.21$

$13 \cdot 2.21$   
 $x = v \cdot t$   
 $x = 13 \cdot 2.21$   
 $28.73 - 15 \quad x = 13.73 \text{ m}$

11.  $V = 31$

$V_y = 31 \cdot \sin 51$

$\frac{V_{0y}}{g} \cdot 2$

$\theta = 51$

$V_y = 15.62$

$\frac{15.62}{9.8} \cdot 2 = 1.90$

$t_T = 1.90 \cdot 2 = 3.81$

$t = 3.81 \text{ s}$

12.  $V_0 = 18 \text{ m/s}$

$+32 = 18t - 4.9t^2 \quad t = 4.98 \text{ s}$

$y_0 = 32$

$0 = -4.9t^2 + 18t + 32$

$y_f = 0$

$V_y f = 18 + (-9.8) 4.98$

$g = -9.8$

$V_f = -30.80 \text{ m/s}$



$$13. \quad V = 6$$

$$x = 25$$

$$x = v \cdot t$$

$$25 = 6 \cdot t$$

$$t = 4.17$$

$$v = \frac{1}{2} g \cdot t^2$$

$$y = 85.21$$

$$14. \quad V = 22$$

$$\theta = 44$$

$$v_{0y} = 22 \cdot \sin 44$$

$$v_{0y} = \frac{15.28^2}{2(9.8)}$$

$$h_{\max} = 11.92 \text{ m}$$

$$15. \quad y_0 = 41$$

$$y_f = 0$$

$$-41 = v_{yf} - 4.90 t^2$$

$$0 = -4.9 t^2 + 41$$

$$t = 2.89 \text{ s}$$

$$t = 2.89 \text{ s}$$