

Exercício 8.

$$① y = 80 \text{ m}$$

$$v_{0x} = 30 \text{ m/s}$$

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

$$t = \sqrt{\frac{2y}{g}}$$

$$t = \sqrt{\frac{(2)(80 \text{ m})}{9.8 \text{ m/s}^2}}$$

$$t = \sqrt{16.33 \text{ seg}^2}$$

$$t = 4.04 \text{ seg.}$$

$$x = v_{0x} t$$

$$x = 30 \text{ m/s} \times 4.04 \text{ seg}$$

$$x = 121.2 \text{ m}$$

$$v_x = v_{0x}$$

$$v_{0x} \quad v_x = 30 \text{ m/s} \text{ Componente horizontal.}$$

$$v_y = g t$$

$$v_y = 9.8 \text{ m/s}^2 \times 4.04 \text{ seg}$$

$$v_y = 39.59 \text{ m/s}$$

$$v_R = \sqrt{(30 \text{ m/s})^2 + (39.59 \text{ m/s})^2}$$



$$VR = \sqrt{2,467.37 \text{ m}^2/\text{seg}^2}$$

$$VR = 49.67 \text{ m}/\text{seg}$$

$$2) V_{0x} = 198 \text{ Km}/\text{h} \quad y = 312 \text{ m} \quad g = 9.8 \text{ m}/\text{s}^2$$

$$t = \sqrt{\frac{2y}{g}}$$

$$t = \sqrt{\frac{(2)(312 \text{ m})}{9.8 \text{ m}/\text{s}^2}}$$

$$t = \sqrt{63.67 \text{ seg}^2}$$

$$t = 7.98 \text{ Seg}$$

$$x = v_{0x} t$$

$$\frac{198 \text{ Km}/\text{h}}{3600} \cdot \frac{1000 \text{ m}}{1 \text{ Km}} = \frac{198,000}{3,600}$$

$$55 \text{ m}/\text{s}$$

$$x = 55 \text{ m}/\text{s} \times 7.98 \text{ Seg}$$

$$x = 438.9 \text{ m}$$

3. $V_{ox} = 80 \text{ mt/s}$ $Y = 120 \text{ mt}$ $g = 9.8 \text{ mt/s}^2$

$$t = \sqrt{\frac{2Y}{g}}$$

$$t = \sqrt{\frac{(2)(120 \text{ mt})}{9.8 \text{ mt/s}^2}}$$

$$t = \sqrt{24.49 \text{ seg}^2}$$

$$t = 4.95 \text{ seg}$$

$$X = V_{ox} t$$

$$X = 80 \text{ mt/s} \times 4.95 \text{ seg}$$

$$X = 396 \text{ mt}$$

4. $Y = 1400 \text{ mt}$ $V_{ox} = 140 \text{ m/s}$ $g = 9.8 \text{ mt/s}^2$

$$t = \sqrt{\frac{2Y}{g}}$$

$$t = \sqrt{\frac{(2)(1400 \text{ mt})}{9.8 \text{ mt/s}^2}}$$

$$t = \sqrt{285.71 \text{ seg}^2}$$

$$t = 16.90 \text{ seg}$$



$$X = V_{OX} t$$

$$X = 740 \text{ m/s} * 76.90 \text{ seg}$$

$$X = 2,364 \text{ m/s}$$

$$V_R = \sqrt{(V_X)^2 + (V_Y)^2}$$

$$V_X = V_{OX}$$

$$V_Y = g t$$

$$V_Y = 9.8 \text{ m/s}^2 * 76.90 \text{ seg}$$

$$V_Y = 765.62 \text{ m/s}$$

$$V_R = \sqrt{(740 \text{ m/s})^2 + (765.62 \text{ m/s})^2}$$

$$V_R = \sqrt{17,029.98 \text{ m}^2/\text{s}^2}$$

$$V_R = 216.86 \text{ m/s}$$

5.

$$t_v = 2.5$$

$$v_{oy} = (20 \text{ m/s}) (\cos 30^\circ)$$

$$v_o = 15.32 \text{ m/s}$$

$$t_s = \frac{v_{oy}}{g}$$

$$t_s = 1.56 \text{ seg}$$

$$t_v = 2 (1.56 \text{ seg})$$

$$t_v = 3.12 \text{ seg}$$

$$H_{\max} = \left(\frac{v_{oy}}{2g} \right)^2$$

$$H_{\max} = \left(\frac{15.32 \text{ m/s}}{2 (9.8 \text{ m/s}^2)} \right)^2$$

$$H_{\max} = 11.97 \text{ m/s}$$

$$x = v_{ox} t_v$$

$$v_{ox} = (20 \text{ m/s}) (\cos 30^\circ)$$

$$v_{ox} = 12.86 \text{ m/s}$$

$$x = 12.86 \text{ m/s} \times 3.12 \text{ seg}$$

$$x = 40.12 \text{ m}$$



$$V_{oy} = (20 \text{ m/s}) (\sin 40^\circ)$$

$$V_{oy} = 12.86 \text{ m/s}$$

$$t_s = \frac{h}{m v_{oy}}$$

$$t_s = \frac{712.86 \text{ m/s}}{9.8 \text{ m/s}}$$

$$t_s = 7.37 \text{ seg}$$

$$t_v = 2t_s$$

$$t_v = (2) 7.37 \text{ seg}$$

$$t_v = 14.74 \text{ seg}$$

$$V_{ox} = (20 \text{ m/s}) (\cos 40^\circ)$$

$$V_{ox} = 15.32 \text{ m/s}$$

$$x = v_{ox} t_v$$

$$x = 15.32 \text{ m/s} \times 14.74 \text{ seg}$$

$$x = 224.83 \text{ m}$$



$$b. \quad v_{0y} = (30 \text{ m/s}) (\sin 16^\circ)$$

$$v_{0y} = 79.28 \text{ m/s}$$

$$t_s = \frac{v_{0y}}{g}$$

$$t_s = 79.28 \frac{\text{m/s}}{9.8 \text{ m/s}^2}$$

$$t_s = 7.97 \text{ seg}$$

$$t_v = 2 t_s$$

$$t_v = (2) (7.97 \text{ seg})$$

$$t_v = 3.94 \text{ seg}$$

$$H_{\max} = \left(\frac{-v_{0y}}{2g} \right)^2$$

$$H_{\max} = \left(\frac{-79.28 \text{ m/s}}{(2) (9.8 \text{ m/s}^2)} \right)^2$$

$$H_{\max} = 18.97 \text{ m/s}$$

$$x = v_{0x} t_v$$

$$v_{0x} = (30 \text{ m/s}) * 3.94 \text{ seg}$$

$$v_{0x} = 22.98 \text{ m/s}$$



$$X = 22.98 \text{ m/s} * 3.04 \text{ Sec}$$

$$X = 90.54 \text{ m/s}$$

$$7. \text{ } Vt = 10 \text{ m/s} \quad r = 50 \text{ m} \quad ac = ?$$

$$ac = (Vt)^2$$

$$ac = \frac{(10 \text{ m/s})^2}{50 \text{ m}}$$

$$ac = 2 \text{ m/s}^2$$

$$8. \text{ } Vt = 30 \text{ m/s} \quad r = 0.46 \text{ m} \quad \omega = ?$$

$$\omega = \frac{Vt}{r}$$

$$\omega = \frac{30 \text{ m/s}}{0.46 \text{ m}}$$

$$\omega = 78 \text{ rad/s}$$

9. $v = 10 \text{ cm}$

$$T = 4,252 \text{ s}$$

$$v f = \frac{2\pi f}{T}$$

$$v f = 2(3,1416) \frac{10 \text{ m}}{4,252 \text{ s}}$$

$$v f = 0,0745$$

10. $n = 10 \text{ cm}$

$$t = 4,252$$

$$T = \frac{t}{n}$$

$$T = \frac{4,252}{10}$$

$$T = 425,2 \text{ s}$$