

$$\theta = 45.00^\circ$$

$$m = 45.00 \text{ kg}$$

$$g = 9.81 \frac{\text{m}}{\text{s}^2}$$

$$d = 3,906.05 \text{ m}$$

$$+ < 1.000 \text{ m}$$

$$d_x = v_i \cdot t + \frac{1}{2} a t^2$$

(Note: In the original image, the variable 't' is circled in red, and a red arrow points from it to '60 s' written above.)

$$3,906.05 = v_{ix} \cdot 60$$

$$v_{ix} = 65.10 \frac{\text{m}}{\text{s}}$$

$$\cancel{V_f}^0 = v_{iy} + a_y t$$

$$\frac{-v_{iy}}{g} = t = 30$$

$$\frac{-65.1}{-9.81} = 6.63 \text{ s}$$

a) $\frac{X}{d_x = v_{ix}t + \frac{1}{2}at^2}$

$$d_x = v_{ix}t$$

$$\frac{d_x}{v_{ic}} = t$$

$$v_{ix} = v_{iy} = v_{ic}$$

$$\frac{d_x}{v_{ic}} = \frac{2v_{ic}}{-g}$$

$\frac{Y}{d_y = v_{iy}t + \frac{1}{2}at^2}$

$$0 = v_{iy}t + \frac{1}{2}at^2$$

$$\frac{-v_{ic}}{-g} = t$$

$$\frac{3906.05}{V_{1c}} = \frac{-2V_{1c}}{-9.81}$$

$$38318.3505 = +2V_{1c}^2$$

$$V_{1x} = V_{1y} = V_{1c} = 138.4 \frac{m}{s}$$

$$V_1 = 195.7 \frac{m}{s}$$

$$b) \quad \cancel{V_f}^{2 \rightarrow 0} = V_i^2 + 2ad$$

$$\frac{-V_i^2}{2g} = d \quad d = 976.5 \text{ m}$$

$$c) \quad F = ma \quad V_f^2 = \cancel{v_i^2} + 2ad$$

$$\begin{aligned} F &= ma \\ F &= 212,800 \text{ N} \end{aligned} \quad \begin{aligned} \frac{V_f^2}{2d} &= a \\ \frac{(195.7)^2}{2(4.050)} &= a \\ a &= 4728 \frac{\text{m}}{\text{s}^2} \end{aligned}$$