

①  $\Delta x = 51.2 \text{ m}$

②  $\Delta y = 406.1 \text{ m}$

③  $\Delta t = 17.4 \text{ s}$

④  $\Delta y = 19.6 \text{ m}$

⑤  $v_{yf} = 11.5 \frac{\text{m}}{\text{s}}$

⑥  $v_y = 12.37 \frac{\text{m}}{\text{s}}; v_x = 53.6 \frac{\text{m}}{\text{s}}$

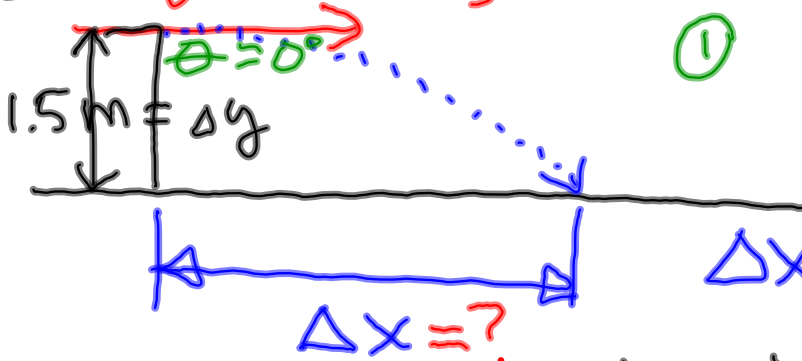
⑦  $v_0 = 4.1 \frac{\text{m}}{\text{s}}$

⑧  $v_0 = 58.6 \frac{\text{m}}{\text{s}}$

⑨  $\Delta x = 57.8 \text{ m}$

⑩  $\theta = 52^\circ; R = 52.8 \text{ m}$

①  $V_0 = 85.3 \frac{m}{s}$



①  $\Delta x = V_x (\Delta t)$

$V_0 \cos \theta$

$\Delta x = 85.3 \frac{m}{s} (\Delta t)$

④  $\Delta x = 85.3 \frac{m}{s} (0.6 \text{ s})$

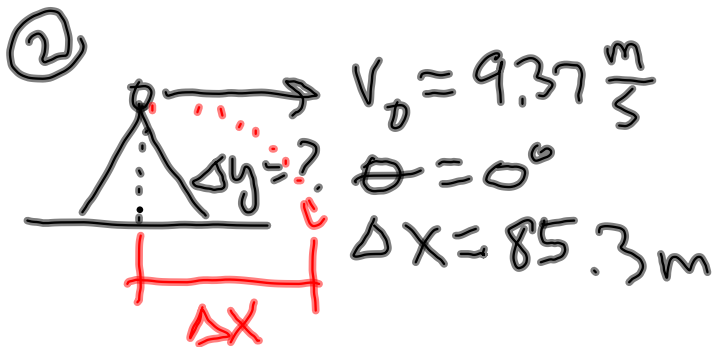
$\Delta x = 51.2 \text{ m}$

②  $\Delta y = V_{y0} (\Delta t) - \frac{1}{2} (9.8) (\Delta t)^2$

$-1.5 \text{ m} = 0 (\Delta t) - 4.9 \frac{m}{s^2} (\Delta t)^2$

③  $\Delta t = 0.6 \text{ s}$

$\sqrt{0.3 \text{ s}^2} = \sqrt{(\Delta t)^2}$



$$\Delta y = v_{y_0} (\Delta t) - \frac{1}{2} g (\Delta t)^2$$

$$\Delta y = \cancel{0} (\Delta t) + 4.9 (\Delta t)^2$$

③



$$V_0 = 85.1 \frac{\text{m}}{\text{s}}$$

$$\theta = 90^\circ$$

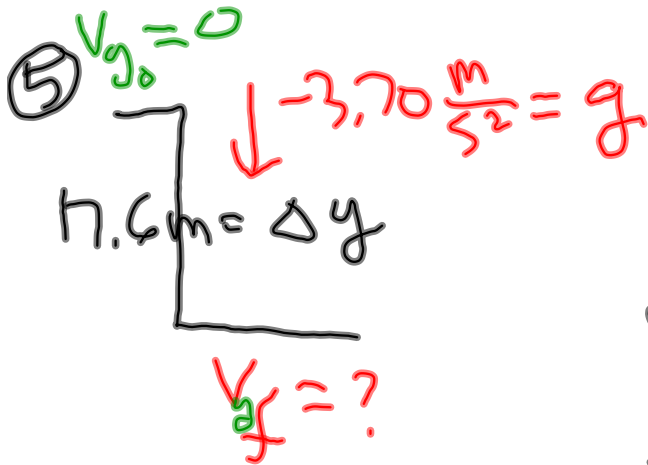
$$\Delta t = ?$$

$$\Delta t = \frac{2V_0 \sin \theta}{g}$$

$$\Delta t = \frac{2(85.1 \frac{\text{m}}{\text{s}}) \sin 90^\circ}{9.8 \frac{\text{m}}{\text{s}^2}}$$

$$\Delta t = \frac{170.2}{9.8} \text{ s}$$

$$\Delta = 17.4 \text{ s}$$



$$v_{yf} = v_{y0} - g(\Delta t)$$

$$v_{yf} = 0 - 3.70 \frac{m}{s^2} (\Delta t)$$

$$v_{yf} = 3.70 \frac{m}{s^2} (\Delta t)$$

$$\Delta y = v_{y0} \Delta t - \frac{1}{2} g (\Delta t)^2$$

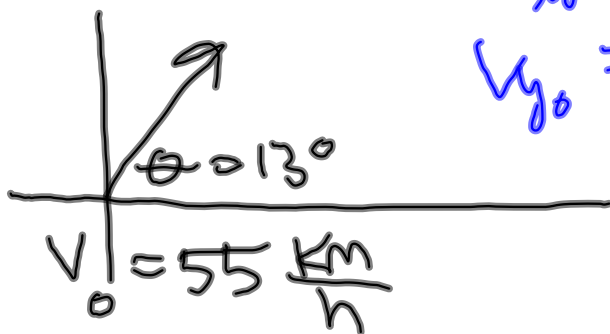
$$17.6 m = 0 (\Delta t) - \frac{1}{2} (-3.70 \frac{m}{s^2}) (\Delta t)^2$$

$$17.6 m = +1.85 \frac{m}{s^2} (\Delta t)^2$$

$$\sqrt{9.5 s^2} = \sqrt{(\Delta t)^2} = \underline{\underline{3.1 s}}$$

$$11.5 \frac{m}{s} = v_{yf}$$

⑥

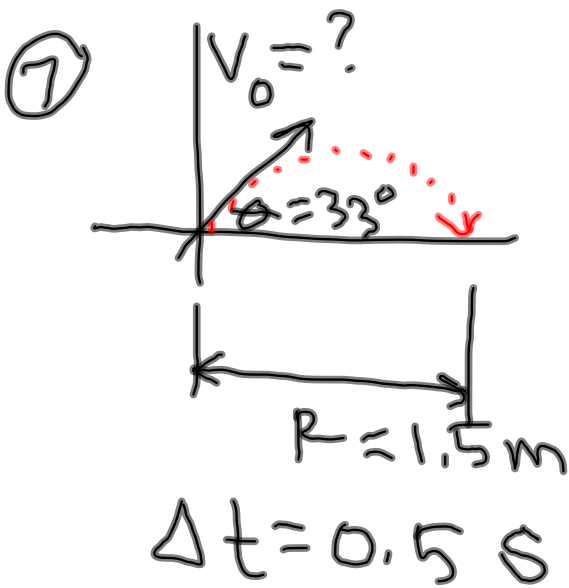


$$V_{x_0} = 53.6 \frac{\text{km}}{\text{h}}$$

$$V_{y_0} = 12.4 \frac{\text{km}}{\text{h}}$$

$$V_{x_0} = ? \quad V_0 \cos \theta = \left(55 \frac{\text{km}}{\text{h}}\right) (\cos 13^\circ)$$

$$V_{y_0} = ? \quad V_0 \sin \theta = \left(55 \frac{\text{km}}{\text{h}}\right) (\sin 13^\circ)$$



$$R = \frac{V_0^2 \sin 2\theta}{g}$$

$$1.5 \text{ m} = \frac{(V_0^2) \sin 66^\circ}{9.8 \frac{\text{m}}{\text{s}^2}}$$

<sup>0.915</sup>

$$\frac{1.5 \text{ m}}{0.09 \frac{\text{m}}{\text{s}^2}} = \frac{0.09 \frac{\text{m}}{\text{s}^2} (V_0^2)}{0.01 \frac{\text{m}}{\text{s}^2}}$$

$$\sqrt{16.7 \text{ s}}$$

$$\sqrt{V_0}$$

$$4.1 \text{ s} = V_0$$

⑨  $R = 57.9 \text{ m}$

$\theta = 52^\circ$

$V_0 = 87 \frac{\text{km}}{\text{h}}$

$R \approx ?$

$R = \frac{(24.2 \frac{\text{m}}{\text{s}})^2 (\sin 104^\circ)}{9.8 \frac{\text{m}}{\text{s}^2}}$

$R = \frac{568.1}{9.8} \text{ m}$

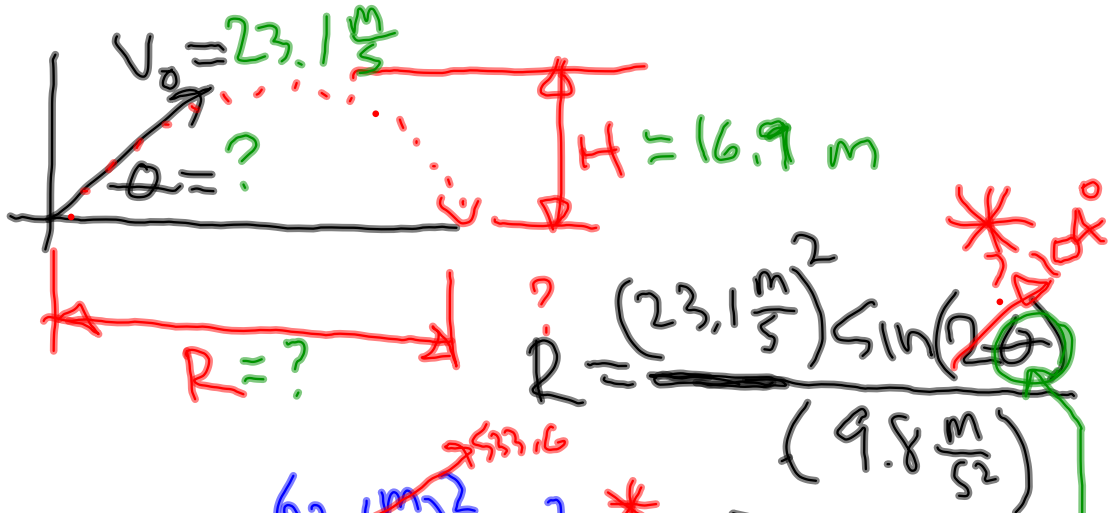
$V_0 = \left( \frac{87 \text{ km}}{1} \right) \left( \frac{1000 \text{ m}}{1 \text{ km}} \right) \left( \frac{1}{3600 \text{ s}} \right)$

$V_0 = \frac{(87)(10)(1)}{(1)(1)(36)} \frac{\text{m}}{\text{s}} \checkmark$

$V_0 = 24.2 \frac{\text{m}}{\text{s}}$



10



$$R = \frac{(23.1 \frac{m}{s})^2 \sin(2\theta)}{(9.8 \frac{m}{s^2})}$$

"H":  $16.9 \text{ m} = \frac{(23.1 \frac{m}{s})^2 \sin^2 \theta}{2(9.8 \frac{m}{s^2})}$

$\therefore R = 52.8 \text{ m}$

$$16.9 \text{ m} = \frac{533.6 \frac{m^2}{s^2} (\sin^2 \theta)}{19.6 \frac{m}{s^2}}$$

$$\frac{16.9 \text{ m}}{27.2 \text{ m}} = \frac{27.2 \text{ m}}{27.2 \text{ m}} \sin^2 \theta$$

$$\sqrt{0.6207} = \sqrt{\sin^2 \theta}$$

$$\sin(0.7879) = \sin \theta$$

$$\underline{52.0^\circ = \theta}$$