

Q9



$$\frac{1}{2} \cdot k \cdot x_1^2 = \frac{1}{2} \cdot m \cdot v_1^2$$

$$x = 0.011$$

$$2.2 - 0.27$$

$$\sqrt{\frac{x_1^2 \cdot k}{m}} = v_1$$

$$= 1.93$$

$$\text{horizontal } D = v_1 \times t = 1.93$$

Find quicker $v_2 > v_1$

$$x_2 > x_1$$

t is the same
bc the horizontal speed
will not affect
the time in the air

$$\sqrt{\frac{x_1^2 \cdot k}{m}} \times t = 1.93$$

$$\sqrt{\frac{x_2^2 \cdot k}{m}} \times t = 2.2$$

$$\begin{cases} t = \frac{1.93}{\sqrt{\frac{x_1^2 \cdot k}{m}}} \\ t = \frac{2.2}{\sqrt{\frac{x_2^2 \cdot k}{m}}} \end{cases} \Rightarrow \frac{1.93}{\sqrt{\frac{x_1^2 \cdot k}{m}}} = \frac{2.2}{\sqrt{\frac{x_2^2 \cdot k}{m}}}$$

$$\Rightarrow 2.2 \times \sqrt{x_1^2 \cdot k} \div \sqrt{m} = 1.93 \times \sqrt{x_2^2 \cdot k} \div \sqrt{m}$$

$$x_1 = 0.011$$

$$\frac{0.011 \times 2.2}{1.93} = x_2 \approx 0.01254 \text{ (m)}$$

$$\Rightarrow 1.254 \text{ (cm)}$$