

Q 1

$$\frac{1}{2}kx^2 = \frac{1}{2}mv^2$$

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$$D_1 = 2.2 \text{ m}$$

$$x = 0.011 \text{ m}$$

$$D_2 = 1.93$$

$$\Delta t = \Delta U = 0$$

$$V = \sqrt{\frac{kx^2}{m}}$$

$$d = \frac{v}{f}$$

$$\frac{\frac{\sqrt{\frac{k \cdot 0.011^2}{m}}}{f}}{\frac{\sqrt{\frac{k \cdot x^2}{m}}}{f}} = \frac{1.93}{2.2}$$

$$\left( \frac{\sqrt{\frac{k \cdot 0.011^2}{m}}}{\cancel{f}} \cdot \frac{\cancel{f}}{\sqrt{\frac{k \cdot x^2}{m}}} = \frac{1.93}{2.2} \right)^2$$

$$\frac{\frac{k \cdot 0.011^2}{m}}{\frac{k \cdot x^2}{m}} = \frac{1.93^2}{2.2^2}$$

$$\frac{x \cdot 0.011^2}{x^2} \cdot \frac{m}{k \cdot x^2} = \frac{1.93^2}{2.2^2}$$

$$\frac{0.011^2}{x^2} = \frac{1.93^2}{2.2^2}$$

$$x^2 = 0.011^2 \cdot \frac{2.2^2}{1.93^2}$$

$$x = 0.01253 \text{ m} = 1.25 \text{ cm}$$