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A spring with a constant of  $65 \frac{\text{N}}{\text{m}}$  is attached to a  $0.50 \text{ kg}$  mass. Assuming that the amplitude of motion is  $3.1 \text{ cm}$ , determine

- 1)  $\omega$
- 2)  $V_{\text{max}}$
- 3)  $T$

$$k = 65 \frac{\text{N}}{\text{m}}$$

$$A = 3.1 \text{ cm} = 3.1 \times 10^{-2} \text{ m}$$

$$m = 0.50 \text{ kg}$$

$$\omega = \sqrt{\frac{k}{m}} \quad T = 2\pi \sqrt{\frac{m}{k}}$$

$$1) \quad \omega = \sqrt{\frac{k}{m}} = \sqrt{\frac{65 \text{ N/m}}{0.50 \text{ kg}}} = \boxed{11 \frac{\text{rad}}{\text{s}}}$$

$$2) \quad V_{\text{max}} = A\omega = 3.1 \times 10^{-2} \text{ m} \left( 11 \frac{\text{rad}}{\text{s}} \right) = \boxed{0.35 \frac{\text{m}}{\text{s}}}$$

$$3) \quad T = 2\pi \sqrt{\frac{m}{k}} = 2\pi \sqrt{\frac{0.50 \text{ kg}}{65 \text{ N/m}}} = \boxed{0.55 \text{ s}}$$