

Name:

Date:

Period:

Unit 08(A) Review (Simple Harmonic Motion)

$$T_P = 2\pi\sqrt{\frac{\ell}{g}} \quad T_S = 2\pi\sqrt{\frac{m}{k}} \quad F_P = -mg\theta \quad F_S = -kd \quad F_G = mg$$

1. A 0.3-kg mass is attached to a vertical spring. When the mass is attached, the spring stretches by 0.15 m. Calculate the spring constant of the spring.

2. Calculate the period and frequency of a pendulum with length 1.4 m.

3. A spring makes 9 oscillations in 15 s. The spring constant is 80 N/m. What mass is on the spring?

Answers:

(1) $k = 19.6 \text{ N/m}$

(2) $T = 2.37 \text{ s}$; $f = 0.42 \text{ Hz}$

(3) $m = 5.67 \text{ kg}$

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4. What are the four equations you need to have memorized?

5. Define the following:

(a) amplitude

(b) equilibrium

(c) frequency

(d) period

(e) restoring force

(f) spring constant

6. Explain why an oscillator keeps moving when it gets to equilibrium, even though the net force there is zero.

7. Why doesn't amplitude affect period?

8. What two factors affect the period of a spring? What two factors affect the period of a pendulum?