

1. A spring attached to the ceiling is stretched one foot by a four pound weight. The value of the Hooke's Law spring constant, k , is

Select the correct answer.

- (a) 4 pounds per foot
 - (b) 1/4 pound per foot
 - (c) 1/4 foot-pound
 - (d) 4 foot-pounds
 - (e) none of the above
- (17)

2. In the previous problem, if the mass is set in motion, the natural frequency, ω , is

Select the correct answer.

- (a) $4\sqrt{2}$ sec
 - (b) $4\sqrt{2}$ sec⁻¹
 - (c) 32 sec
 - (d) 32 sec⁻¹
 - (e) sec⁻¹
- (18)

3. In the previous two problems, the correct differential equation for the position, $x(t)$, of the mass at a function of time, t , is

Select the correct answer.

- (a) $\frac{d^2x}{dt^2} + x/4 = 0$
 - (b) $\frac{d^2x}{dt^2} + 2x = 0$
 - (c) $\frac{d^2x}{dt^2} + 4x = 0$
 - (d) $\frac{d^2x}{dt^2} + 8x = 0$
 - (e) $\frac{d^2x}{dt^2} + 32x = 0$
- (19)

4. If the mass in the previous problem is pulled down two feet and released, the solution for the position is

Select the correct answer.

- (a) $x = 2 \cos(4\sqrt{2}t) + 2 \sin(4\sqrt{2}t)$
 - (b) $x = 2 \sin(4\sqrt{2}t)$
 - (c) $x = 2 \cos(4\sqrt{2}t)$
 - (d) $x = 2 \sin(4t)$
 - (e) $x = 2 \cos(4t)$
- (20)