1. Vibration of an object about an equilibrium point is called Simple Harmonic Motion When the restoring force is proportional to the _____ and in the opposite direction.

2. A mass attached to a spring vibrates back and forth. At the equilibrium position, what values are at a maximum?

3. A mass attached to a spring vibrates back and forth. At the equilibrium position, what values are zero?

4. A mass attached to a spring vibrates back and forth. At maximum displacement, what values are at a maximum?

5. A mass attached to a spring vibrates back and forth. At maximum displacement, what values are zero?

6. A simple pendulum swings in simple harmonic motion. At maximum displacement, what values are at a maximum?

7. A simple pendulum swings in simple harmonic motion. At maximum displacement, what values are zero?

8. A mass-spring system can oscillate with simple harmonic motion because a compressed or stretched spring has which kind of energy?

9. A simple pendulum swings in harmonic motion. At the equilibrium position the bob has which kind of energy?

10. A simple pendulum swings in harmonic motion. At maximum displacement the bob has which kind of energy?

11. If a pendulum is adjusted so that its frequency changes from 10 Hz to 20 Hz, its period will change from n seconds to

12. By what factor should the length of a simple pendulum be changed to triple the period of vibration?

13. For a system in simple harmonic motion, what word do we use to represent the number of cycles or vibrations per unit of time?

14. For a system in simple harmonic motion, what word do we use to represent the time required to complete one cycle of motion?

15. A stretched or compressed spring stores _____ potential energy

16. In the equation for Hooke's Law, $F_{elastic} = -kx$, the term k represents the _____ of a spring.

17. A certain pendulum with a 1.00 kg bob has a period of 3.50 s. What will happen to the period of the pendulum if the 1.00 kg bob is replaced by a bob with a mass of 2.00 kg? Explain your answer.

18. How much displacement will a coil spring with a spring constant of 110 N/m achieve if it is stretched by 70 N force?

19. A mass on a spring that has been compressed 0.29 m has a restoring force of 82 N. What is the value of this spring's spring constant?

20. An amusement park ride has a frequency of 0.064 Hz. What is the ride's period?

21. A truck with bad shock absorbers bounces up and down after hitting a bump. The truck has a mass of 1700 kg and is supported by four springs, each having a spring constant of 6200 N/m. What is the period for each spring? (Each spring takes an equal portion of the total mass)

22. What is the period of a 6.93 m long pendulum with a bob of mass 68 kg? Assume the acceleration due to gravity is 9.81 m/s^2.

23. A student wishes to construct a mass-spring system that will oscillate with the same frequency as a swinging pendulum with a period of 3.99 s. The student has a spring with a spring constant of 77.1 N/m. What mass should the student use to construct the mass-spring system?

24. On planet X, a pendulum of length 4 meters has a period of 1.8 seconds. What is the acceleration due to gravity on planet X?

25. A 10 kg mass is attached to a spring of unknown spring constant k. It is displaced and released and begins to oscillate. If the period of this oscillation is 1.2 seconds, then what is the value of the unknown spring constant?

26. A pendulum of unknown length is put into simple harmonic motion on planet Y. Planet Y has an acceleration due to gravity with a magnitude of 20.5 m/s^2. If the period of this motion is 0.4 seconds, what is the length of the pendulum?