

Name: _____

Pendulum Post-Lab Questions

Multiple Choice

Identify the choice that best completes the statement or answers the question.

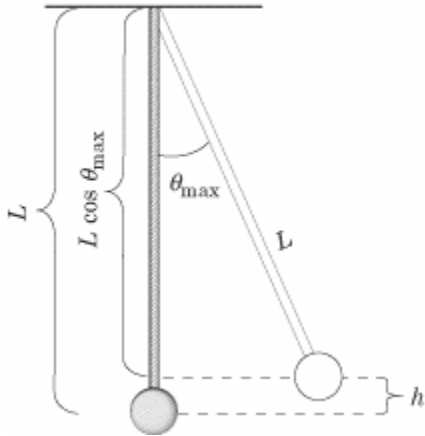
- _____ 1. The angle between the string of a pendulum at its equilibrium position and at its maximum displacement is its
a. period. c. vibration.
b. frequency. d. amplitude.
- _____ 2. A pendulum swings through a total of 28° . If the displacement is equal on each side of the equilibrium position, what is the amplitude of this vibration? (Disregard frictional forces acting on the pendulum.)
a. 28° c. 56°
b. 14° d. 7.0°
- _____ 3. By what factor should the length of a simple pendulum be changed if the period of vibration were to be tripled?
a. 3 c. 9
b. 6 d. 27
- _____ 4. What is the period of a 4.12 m long pendulum?
a. 2.01 s c. 4.07 s
b. 3.11 s d. 9.69 s
- _____ 5. On the planet Xenos, an astronaut observes that a 1.00 m long pendulum has a period of 1.50 s. What is the free-fall acceleration on Xenos?
a. 4.18 m/s^2 c. 17.5 m/s^2
b. 10.2 m/s^2 d. 26.3 m/s^2
- _____ 6. A pendulum clock is taken to the moon ($g = 1.6 \text{ m/s}^2$). How long must the pendulum be in order for the clock to continue keeping accurate time (1 second/cycle)?
a. 3.2 m c. 0.25 m
b. 7.9 m d. 0.041 m
- _____ 7. What is the period of a pendulum near Earth's surface that is 130 cm long?
a. 2.3 s c. 9.1 s
b. 0.83 s d. 22.9 s

Problem

8. A pendulum with a length of 0.600 m has a period of 1.55 s. What is the acceleration due to gravity at the pendulum's location?
9. Calculate the percent change in the time period of a simple pendulum when its length changes by a factor of 1.1 and the acceleration due to gravity changes by a factor of 1.2.
10. How long must a pendulum be to have a period of 4.7 seconds?

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11. Honors Physics: Derive the formula for the maximum speed, v_{\max} of a simple pendulum bob in terms of g , the length l , and the angle of swing θ_{\max} . Hint: picture and $mgh = 1/2mv^2$.



12. Why doesn't a simple pendulum approximate SHM for large angles?

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