

PHYSICS
PROBLEMS:
SIMPLE HARMONIC MOTION/PENDULUM

NAME _____
DATE _____ PERIOD _____

1. Determine the period of a pendulum 1.0 m long.

$$\begin{aligned} T &= 2\pi \sqrt{\frac{L}{g}} \\ &= 2\pi \sqrt{\frac{1\text{ m}}{9.8\text{ m/s}^2}} \\ &= \boxed{2\text{ seconds.}} \end{aligned}$$

2. The period of a pendulum is 1.0 seconds. Find its length in meters.

$$T = 1.0\text{ sec}$$

$$L = ?$$

$$\begin{aligned} L &= g \left(\frac{T}{2\pi}\right)^2 \\ &= 9.8 \left(\frac{1\text{ s}}{2\pi}\right)^2 \\ &= 0.25\text{ m} \end{aligned}$$

3. After landing on an alien planet in a galaxy far away, you carefully measure the period of a pendulum 2.0 meters long, and find it to be 3.5 seconds. What is the value of "g" on the planet?

$$L = 2.0\text{ m}$$

$$T = 3.5\text{ s}$$

$$g =$$

$$\begin{aligned} g &= L \left(\frac{2\pi}{T}\right)^2 \\ &= 2.0\text{ m} \left(\frac{2\pi}{3.5\text{ s}}\right)^2 \\ &= \boxed{6.4\text{ m/s}^2} \end{aligned}$$