Answer on Question #55611, Physics / Mechanics | Relativity

The slope of the graph of T^2 plotted on the vertical axis against *l* on the horizontal axis is used to determine the value of ----------

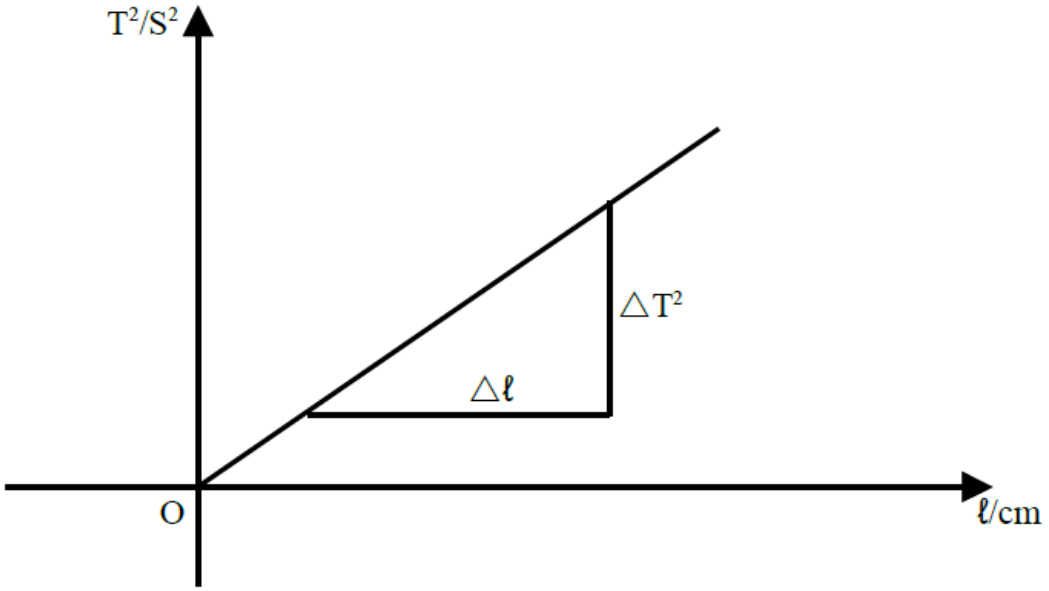
A. frequency
B. period
C. phase
D. acceleration due to gravity

Solution:

Consider the expression that relates the period of oscillation of a simple pendulum (T) with the length (l) of the pendulum.

$$T = 2\pi\sqrt{\frac{l}{g}}$$

Plotting the graph of T^2 on the vertical axis and ℓ on the horizontal axis will give us a straight line passing through the origin as shown in figure.



The slope or the gradient of the graph is given as

$$\frac{\Delta T^2}{\Delta \ell} = \frac{\text{Increase in } T^2}{\text{Increase in } \ell} = m = \frac{4\pi^2}{g}$$

The value of g, acceleration due to gravity may then be obtained, by substitution of values of known variables in the relation.

Answer: **D. acceleration due to gravity**