A simple pendulum has a length of 3-m and it is oscillating on an unknown planet. It has a period of oscillation of 6 sec. What is the acceleration due to gravity on the planet on which the pendulum oscillates?

Given:

Length of simple pendulum: $\boldsymbol{\ell} = 3\text{-m}$

Time period of the pendulum: $T = 6$ sec

Determine: acceleration due to gravity on the planet: g_p

Use formula:

$$T = 2\pi \left(\boldsymbol{\ell} / g_p \right)^{1/2} \text{ ----------(1)}$$

Substituting for T, π, and $\boldsymbol{\ell}$ in (1):

$$6 = 2 \times 3.14 \times \left(3 / g_p \right)^{1/2} \text{ ----------(2)}$$

Rearranging and simplifying (2):

$$\mathbf{g_p = 3.29\ m / s^2}$$