

A simple pendulum has a length of 2.5-m. What is its period of oscillations:

- a) On Earth
- b) On Moon

Given:

Length of the simple pendulum:  $l = 2.5\text{-m}$

- a) Determine: period of oscillation on Earth:  $T_E$

Use Formula:

$T_E = 2\pi (l / g_E)^{1/2}$  where  $g_E$  is acceleration due to gravity on Earth:  $g_E = -9.8 \text{ m/s}^2$ .

Substituting for  $\pi$ ,  $l$  and  $g_E$ :

$$T_E = 2\pi (l / g_E)^{1/2} = 2 \times 3.14 \times (2.5 / |-9.8|)^{1/2} = 3.2 \text{ sec}$$

- b) Determine: period of oscillation on Moon:  $T_M$

Use Formula:

$T_M = 2\pi (l / g_M)^{1/2}$  where  $g_M$  is acceleration due to gravity on Earth:  $g_M = -1.625 \text{ m/s}^2$ .

Substituting for  $\pi$ ,  $l$  and  $g_M$ :

$$T_M = 2\pi (l / g_M)^{1/2} = 2 \times 3.14 \times (2.5 / |-1.625|)^{1/2} = 7.8 \text{ sec}$$