

Question #36116

A small object is released from rest and falls 1.00×10^2 feet near the surface of the earth. Neglect air resistance.

How long will it take to fall through the 1.00×10^2 feet mentioned?

3.12 s

4.50 s

2.49 s

6.25 s

10.0 s

Solution:

An object makes the free falling by gravity

The distance travelling on free falling (height) is

$H = H_0 - \frac{1}{2}gt^2$ where H_0 is the initial height g is the acceleration due the gravity t is the time

Accepting the final height equal to zero

$$H_0 = \frac{1}{2}gt^2$$

$$t = \sqrt{\frac{2H_0}{g}}$$

$$g = 32.17 \text{ ft/s}^2$$

$$t = \sqrt{\frac{2 \cdot 1.00 \cdot 10^2}{32.17}} = 2.49 \text{ sec}$$

Answer: 2.49 sec, (third answer).