Question #72328, Physics / Other

An object of mass 2 kg is thrown vertically downwards with an initial kinetic energy of 100J. What is the distance fallen by the object at the instant when its kinetic energy has doubled?

Solution

When the object is fallen, its gravitational potential energy is converted into kinetic energy. Neglecting the air drag, the law of conservation of energy is represented by the following equation.

$$\Delta E_k = \Delta E_{GP} = mg\Delta h;$$

Hence, the height is determined as follows.

$$\Delta h = \frac{\Delta E_k}{mg};$$

$$\Delta h = \frac{100}{2 \times 9.81} = 5.1\,\text{m}$$

Answer: the distance fallen by the object is 5.1 m.