Task. A stone dropped from the roof building takes 4 seconds to reach the ground. Find the height of the building.

Solution. A stone moved with initial zero velocity and constant acceleration $g = 9.8 \ m/s^2$ due to gravitation. Therefore the distance which it pasees by time t is given by the formula:

$$d(t) = \frac{gt^2}{2}.$$

For $t = 4$ this distance is equal to the height h of the building, so

$$h = d(4 \ s) = \frac{9.8 * 4^2}{2} = \frac{9.8 * 16}{2} = 9.8 * 8 = 78.4 \ m.$$

Answer. $78.4 \ m.$