Task. An object is dropped from a platform 100 feet high. Ignoring wind resistance, what will its speed be when it reaches the ground?

Solution. There is a gravitation force acting on the object. Therefore it moves with constant acceleration $g = 9.8\ m/s^2$. Since it was dropped, its initial velocity is zero. Therefore its height at time t is given by the formula:

$$h(t) = h_0 - \frac{gt^2}{2},$$

where $h_0 = 100$ feet is the initial height. We should find t such that $h(t) = 0$, that is

$$h_0 - \frac{gt^2}{2} = 0$$

$$t^2 = \frac{2h_0}{g}.$$

$$t = \sqrt{\frac{2h_0}{g}}.$$

Notice that

$$1 \text{ foot} = 0.3048\ m,$$

so

$$h_0 = 100 \text{ feet} = 304.8\ m.$$

Therefore

$$t = \sqrt{\frac{2h_0}{g}} = \sqrt{\frac{2 * 304.8}{9.8}} = \sqrt{\frac{609.6}{9.8}} = \sqrt{62.204} = 7.8870 \approx 7.9\ s.$$

Answer. 7.9 s.