

27. The constant acceleration stated in the problem permits the use of the equations in Table 2-1.

(a) We solve $v = v_0 + at$ for the time:

$$t = \frac{v - v_0}{a} = \frac{\frac{1}{10} (3.0 \times 10^8 \text{ m/s})}{9.8 \text{ m/s}^2} = 3.1 \times 10^6 \text{ s}$$

which is equivalent to 1.2 months.

(b) We evaluate $x = x_0 + v_0t + \frac{1}{2}at^2$, with $x_0 = 0$. The result is

$$x = \frac{1}{2} (9.8 \text{ m/s}^2) (3.1 \times 10^6 \text{ s})^2 = 4.7 \times 10^{13} \text{ m} .$$