46. We write the length unit light-month as c·month in this solution.

(a) The magnitude of the required acceleration is given by

$$a = \frac{\Delta v}{\Delta t} = \frac{(0.10)(3.0 \times 10^8 \text{ m/s})}{(3.0 \text{ days})(86400 \text{ s/day})} = 1.2 \times 10^2 \text{ m/s}^2 \ .$$

(b) The acceleration in terms of g is

$$a = \left(\frac{a}{g}\right) g = \left(\frac{1.2 \times 10^2 \text{ m/s}^2}{9.8 \text{ m/s}^2}\right) g = 12g \ .$$

(c) The force needed is

$$F = ma = \left(1.20 \times 10^6\right)\left(1.2 \times 10^2\right) = 1.4 \times 10^8 \text{ N} \ .$$

(d) The spaceship will travel a distance $d = 0.1$ c·month during one month. The time it takes for the spaceship to travel at constant speed for 5.0 light-months is

$$t = \frac{d}{v} = \frac{5.0 \text{ c} \cdot \text{months}}{0.1c} = 50 \text{ months}$$

which is about 4.2 years.