Problem 46

Light travels a distance of about 3×10^8 m/s. A light-minute is the distance light travels in 1 min. If the Sun is 1.5×10^{11} m from Earth, how far away is it in light-minutes?

Solution

Multiply the conversion factors appropriately so that light-minutes appears in the numerator, starting with the given distance from Earth to Sun.

$$1.5 \times 10^{11} \, \cancel{\text{m}} \times \frac{1 \, \cancel{\text{s}}}{3 \times 10^8 \, \cancel{\text{m}}} \times \frac{1 \, \cancel{\text{min}}}{60 \, \cancel{\text{s}}} \times \frac{1 \text{ light-minute}}{1 \, \cancel{\text{min}}} \approx 8.3 \text{ light-minutes}$$