

Exercise 1.16

How many gallons of gasoline are used in the United States in one day? Assume that there are two cars for every three people, that each car is driven an average of 10,000 miles per year, and that the average car gets 20 miles per gallon.

Solution

The population of the United States is about 300 million. Arrange the given conversion factors so that the desired units of gallons per day remain.

$$300 \times 10^6 \text{ ~~people~~} \times \frac{2 \text{ ~~cars~~}}{3 \text{ ~~people~~}} \times \frac{10\,000 \text{ ~~mi/year~~}}{1 \text{ ~~car~~}} \times \frac{1 \text{ gallon}}{20 \text{ ~~mi~~}} \times \frac{1 \text{ ~~year~~}}{365 \text{ days}} \approx 3 \times 10^8 \frac{\text{gallons}}{\text{day}}$$