Ch. 2 Problems: 5, 8, 9, 39, 41, 55, 63, 67, 71, 75, 83, 85, 91, 93, 99, 109, 111, 115, 119, 121, 123, 125

7th Edition

# 1 Problem 121

A car has a mileage rating of 38 mi per gallon of gasoline. How many miles can the car travel on 76.5 L of gasoline?

# 2 Problem 123

Consider these observations on two blocks of different unknown metals:

| Block name | Volume |
|---|---|
| Block A | 125 $cm^3$ |
| Block B | 145 cm |

If block A has a greater mass than block B, what can be said of the relative densities of the two metals? (Assume that both blocks are solid.)

## 2.1 Solution

Block A has a greater mass and a smaller volume. As such, since $\rho = \frac{V}{m}$, it has a greater density.

# 3 Problem 125

You measure the masses and volumes of two cylinders. The mass of cylinder 1 is 1.35 times the mass of cylinder 2. The volume of cylinder 1 is 0.792 the volume of cylinder 1. If the density of cylinder 1 is 3.85 $g/cm^3$, what is the density of cylinder 2?

## 3.1 Solution

$$m_1 = 1.35 m_2 \tag{1}$$

$$V_1 = 0.792 V_2 \tag{2}$$

$$\rho_1 = \frac{m_1}{V_1} = \frac{1.35 m_2}{0.792 V_2} = \frac{1.35}{0.792}\rho_2 \tag{3}$$

$$\rho_2 = \frac{0.792}{1.35}\rho_1 = \frac{0.792}{1.35} * 3.85 \mathrm{g/cm^3} = \boxed{2.26 \mathrm{g/cm^3}} \tag{4}$$