Converting Units Between Different Systems

Study Tip

Quick approximations:

$1 \text{ mi} \approx \frac{8}{5} \text{ km}$

$F \approx 2C + 30$

$1 \text{ gal} \approx 4 \text{ L}$

$1 \text{ lb} \approx \frac{2}{5} \text{ kg}$

Common Unit Conversions

Distance:

$1 \text{ mi} \approx 1.61 \text{ km}$

$1 \text{ in.} = 2.54 \text{ cm}$

Volume/Capacity:

$1 \text{ gal} \approx 3.79 \text{ L}$

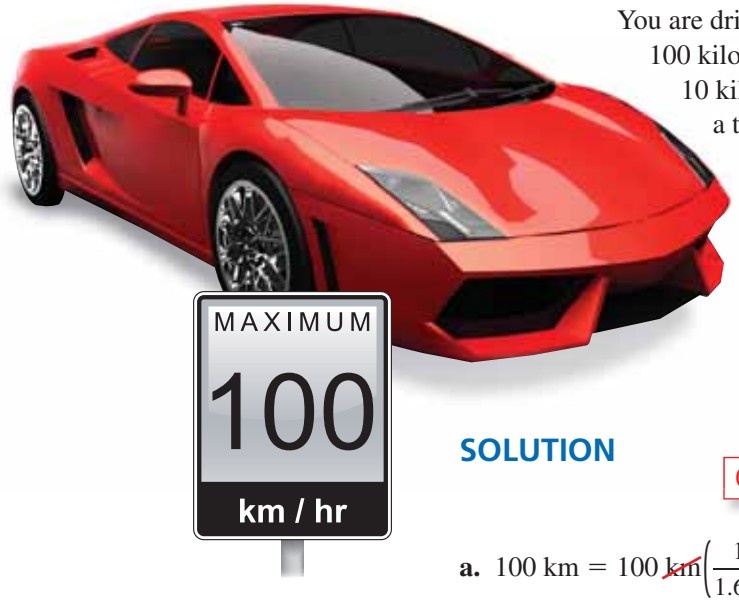
Temperature:

$F = \frac{9}{5}C + 32$

Weight/Mass:

$1 \text{ lb} \approx 0.45 \text{ kg}$

EXAMPLE 5 Converting Units



You are driving on a Canadian highway. The speed limit is 100 kilometers per hour. You figure that you can drive 10 kilometers per hour over the limit without getting a ticket. Your speedometer only shows miles per hour.

a. What is the maximum speed you should be traveling in miles per hour?

b. Following your "rule," what is the maximum speed you should be traveling in miles per hour to avoid getting a speeding ticket?

SOLUTION

One

a. $100 \text{ km} = 100 \text{ km}\left(\frac{1 \text{ mi}}{1.61 \text{ km}}\right) \approx 62 \text{ mi}$

The speed limit is about 62 miles per hour.

b. $110 \text{ km} = 110 \text{ km}\left(\frac{1 \text{ mi}}{1.61 \text{ km}}\right) \approx 68 \text{ mi}$

Your "rule" indicates that you can drive up to 68 miles per hour without getting a speeding ticket.

Checkpoint

Help at Math.andYOU.com

While in Canada, you stop at a gas station. You have heard that gas prices in Canada are considerably more expensive than in the United States.

c. From the sign at the left, does this seem to be true?

d. To answer part (c), what conversion should you consider in addition to the conversion between gallons and liters?