

Lesson 2-2

Example 1

Complete.

a. $150 \text{ m} = \underline{\quad? \quad} \text{ km}$

b. $256 \text{ cm} = \underline{\quad? \quad} \text{ mm}$

c. $2.5 \text{ L} = \underline{\quad? \quad} \text{ cL}$

d. $3.65 \text{ g} = \underline{\quad? \quad} \text{ kg}$

Solution

a. $150 \text{ m} = 150 \div 1000 \text{ km} = 0.15 \text{ km}$

b. $256 \text{ cm} = 256 \cdot 10 \text{ mm} = 2560 \text{ mm}$

c. $2.5 \text{ L} = 2.5 \cdot 100 \text{ cL} = 250 \text{ cL}$

d. $3.65 \text{ g} = 3.65 \div 1000 \text{ kg} = 0.00365 \text{ kg}$

Example 2

Perform the following conversions.

a. Change $\frac{2}{3}$ yd to inches.

b. Change 30 oz to quarts.

Solution

a. Multiply to change from a large unit to a small unit.

$$\frac{2}{3} \cdot 36 = \frac{2 \cdot 36}{3} = \frac{72}{3} = 24 \text{ in.} \quad 1 \text{ yd} = 36 \text{ in.}$$

b. Divide to change from a smaller unit to a larger unit.

$$30 \div 32 = \frac{30}{32} = \frac{15}{16} \text{ qt} \quad 1 \text{ qt} = 32 \text{ oz}$$

Example 3

WOODWORKING Brett is making wooden bookshelves. He wants each bookshelf to be 28 in. wide. If he saws the first shelf off of a $2\frac{1}{2}$ -yd board, how much wood will he have left?

Solution

$$2\frac{1}{2} \cdot 36 = 90 \text{ in.}$$

Change $2\frac{1}{2}$ yd to the equivalent number of inches. 1 yd = 36 in.

Find the difference between the original length of the board and the amount that he sawed off.

$$90 \text{ in.} - 28 \text{ in.} = 62 \text{ in.}$$

$$62 \div 12 = 5 \text{ with remainder } 2$$

Brett will have 62 in. or 5 ft 2 in. of wood left.

Example 4

Calculate. Write each answer in simplest form.

a.
$$\begin{array}{r} 5 \text{ ft } 8 \text{ in.} \\ + 6 \text{ ft } 9 \text{ in.} \\ \hline \end{array}$$

b.
$$\begin{array}{r} 15 \text{ lb } 4 \text{ oz} \\ - 10 \text{ lb } 7 \text{ oz} \\ \hline \end{array}$$

c. $5(3 \text{ qt } 1 \text{ pt})$

d. $24 \text{ km} \div 120 = \underline{\quad? \quad} \text{ m}$

Solution

a.
$$\begin{array}{r} 5 \text{ ft } 8 \text{ in.} \\ + 6 \text{ ft } 9 \text{ in.} \\ \hline 11 \text{ ft } 17 \text{ in.} \end{array}$$
 17 in. is more than 1 ft.

$$\begin{aligned} 11 \text{ ft } 17 \text{ in.} &= 11 \text{ ft} + (1 \text{ ft} + 5 \text{ in.}) \\ &= (11 \text{ ft} + 1 \text{ ft}) + 5 \text{ in.} \\ &= 12 \text{ ft } 5 \text{ in.} \end{aligned}$$

c. $5(3 \text{ qt } 1 \text{ pt}) = 15 \text{ qt } 5 \text{ pt}$

Rewrite 5 pt using quarts and pints.

$$\begin{aligned} 15 \text{ qt } 5 \text{ pt} &= 15 \text{ qt} + (2 \text{ qt} + 1 \text{ pt}) \\ &= 17 \text{ qt } 1 \text{ pt} \end{aligned}$$

b. Rewrite 15 lb 4 oz, since 7 oz cannot be subtracted from 4 oz.

$$\begin{aligned} 15 \text{ lb } 4 \text{ oz} &= (14 \text{ lb} + 16 \text{ oz}) + 4 \text{ oz} \\ &= 14 \text{ lb } 20 \text{ oz} \end{aligned}$$

$$\begin{array}{r} 14 \text{ lb } 20 \text{ oz} \\ - 10 \text{ lb } 7 \text{ oz} \\ \hline 4 \text{ lb } 13 \text{ oz} \end{array}$$

d. Since $1 \text{ km} = 1000 \text{ m}$, $24 \text{ km} = 24,000 \text{ m}$.
 $24 \text{ km} \div 120 = 24,000 \text{ m} \div 120 = 200 \text{ m}$