8.3 Multi-Step Conversions

To convert from one measure to another measure, you may need to multiply by more than one conversion factor.

4 yd = ? in.

$$4\ \text{yd} \times \frac{3\ \text{ft}}{1\ \text{yd}} \times \frac{12\ \text{in}}{1\ \text{ft}} = 144\ \text{in.}$$

27.2 d = ? sec.

$$27.2\ \text{d} \times \frac{24\ \text{hr}}{1\ \text{d}} \times \frac{60\ \text{min}}{1\ \text{hr}} \times \frac{60\ \text{sec}}{1\ \text{min}} = 2{,}350{,}080\ \text{se}$$

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3 mi = ? in.

$$3\ \text{mi} \times \frac{5280\ \text{ft}}{1\ \text{mi}} \times \frac{12\ \text{in}}{1\ \text{ft}} = 190{,}080\ \text{in.}$$

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50 c = ? gal

$$50\ \text{c} \times \frac{1\ \text{pt}}{2\ \text{c}} \times \frac{1\ \text{qt}}{2\ \text{pt}} \times \frac{1\ \text{gal}}{4\ \text{qt}} = \frac{50\ \text{gal}}{16} = 3.125$$

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3 gal = ? fl oz

$$3\ \text{gal} \times \frac{4\ \text{qt}}{1\ \text{gal}} \times \frac{2\ \text{pt}}{1\ \text{qt}} \times \frac{2\ \text{c}}{1\ \text{pt}} \times \frac{8\ \text{fl oz}}{1\ \text{c}} = 384\ \text{fl oz}$$

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/ = per

A commuter train can travel as fast as 48.5 meters per second. What is the speed in kilometers per hour.

48.5 m/sec = ? km/hr.

$$\frac{48.5\ \cancel{m}}{1\ \cancel{sec}} \times \frac{1\ \cancel{km}}{1000\ \cancel{m}} \times \frac{60\ \cancel{sec}}{1\ \cancel{min}} \times \frac{60\ \cancel{min}}{1\ hr} = \frac{174,600\ km}{1000\ hr} = \frac{174.6\ km}{1\ hr}$$

In a bicycle race, a rider's speed is 26.4 ft per second. What is the speed in miles per hour.

26.4 ft/sec = ? mi/hr

$$\frac{26.4\ \cancel{ft}}{1\ \cancel{sec}} \times \frac{1\ mi}{5280\ \cancel{ft}} \times \frac{60\ \cancel{sec}}{1\ \cancel{min}} \times \frac{60\ \cancel{min}}{1\ hr} = \frac{95,040\ mi}{5280\ h} = \frac{18\ mi}{h}$$

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105 cm/hr = ? ft/day

$$\frac{105\ \cancel{cm}}{1\ \cancel{hr}} \times \frac{1\ \cancel{in}}{2.54\ \cancel{cm}} \times \frac{1\ ft}{12\ \cancel{in}} \times \frac{24\ \cancel{hr}}{1\ day} = \frac{2520\ ft}{30.48\ day} = \frac{82.67\ ft}{day}$$

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