1.

1 gallon = 4 quarts 1 US gallon = 3.79 liters

Turn each of the above into a conversion factor then use them to convert 100 Quarts into Liters.

$$100\ \text{Qts} \cdot \frac{1\ \text{gal}}{4\ \text{Qts}} \cdot \frac{3.79\ \text{L}}{1\ \text{gal}} = 94.75\ \text{Liters}$$

2.

1 mile = 5280 feet 1 foot = 12 inches

1 inch = 2.54 cm 100 cm = 1 meter

Turn each of the above into a conversion factor then use them to convert 2 miles into meters.

$$2\ \text{miles} \cdot \frac{5280\ \text{ft}}{1\ \text{mi}} \cdot \frac{12\ \text{in}}{1\ \text{ft}} \cdot \frac{2.54\ \text{cm}}{1\ \text{in}} \cdot \frac{1\ \text{m}}{100\ \text{cm}} = 3218.69\ \text{m}$$

3. Convert 75 feet per second into miles per hour.

5280 feet = 1 mile

$$\frac{75\ \text{ft}}{1\ \text{sec}} \cdot \frac{1\ \text{mi}}{5280\ \text{ft}} \cdot \frac{60\ \text{sec}}{1\ \text{min}} \cdot \frac{60\ \text{min}}{1\ \text{hr}} \cdot \text{\_\_\_} = 51.14\ \frac{\text{mi}}{\text{hr}}$$

4. The world record in the 100 meter dash is 9.58 seconds.

Convert this into miles per hour.

1 meter = 3.2808399 feet 5280 feet = 1 mile

$$\frac{100\ \text{meters}}{9.58\ \text{sec}} \cdot \frac{60\ \text{sec}}{1\ \text{min}} \cdot \frac{60\ \text{min}}{1\ \text{hr}} \cdot \frac{3.2808399\ \text{ft}}{1\ \text{m}} \cdot \frac{1\ \text{mi}}{5280\ \text{ft}} = 23.35\ \frac{\text{mi}}{\text{hr}}$$

In the Netherlands gas costs $\frac{1.27 \text{Euros}}{\text{Liter}}$

Convert this into $/gal.

$1 US = 0.74 Euros 1 Liter = 33.814 ounces

1 gallon = 128 ounces

$$\frac{1.27 \text{ Euros}}{1 \text{ liter}} \cdot \frac{\$1}{.74 \text{ Euros}} \cdot \frac{1 \text{ liter}}{33.814 \text{ ounces}} \cdot \frac{128 \text{ ounces}}{1 \text{ gal}}$$

$6.48 \$/gal$

:)

Proportions: Two equal ratios.

$$\frac{a}{b} = \frac{c}{d} \qquad b \neq 0 \text{ and } d \neq 0$$

The cross products of any proportion are equal.

$$ad = bc$$

Solve this proportion.

$$\frac{32}{15} = \frac{12}{x}$$

$15 \cdot 12 = 32x$

$x = 5.625$

Solve this proportion:

$$\frac{x+1}{5} = \frac{x-4}{3}$$

$3(x+1) = 5(x-4)$

$3x + 3 = 5x - 20$

$+20 \quad +20$

$3x + 23 = 5x$

$-3x \quad -3x$

$\frac{23}{2} = \frac{2x}{2}$

$x = 11.5$