

# Key

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Conversions

Name \_\_\_\_\_

Convert the following using the given information.

- (1 foot = 12 inches) (1 inch = 2.540 centimeters) (1 mile = 5280. feet)
- (1 acre = 43560. square feet) (1 gallon = 231 cubic inches)
- (1 kilometer = 1000 meters) (1 kilogram = 2.205 pounds) (1 week = 7 days)
- (1 meter = 100 centimeters = 1000 millimeters) (1 revolution = 360 degrees)
- (1 hour = 60 minutes) (1 minute = 60 seconds) (1 year = 365.25 days)

Use factor-label method. Circle final answer with proper units.

1) Convert 70 seconds into weeks.

$$t = \frac{70 \text{ sec}}{1} \cdot \frac{1 \text{ min}}{60 \text{ sec}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{1 \text{ day}}{24 \text{ hr}} \cdot \frac{1 \text{ wk}}{7 \text{ days}}$$

$$t = \frac{1 \text{ wk}}{6 \cdot 60 \cdot 24} = \frac{1}{8640} \text{ week}$$

or  $\text{time} = 0.00011574 \text{ weeks}$   
 or  $t = 1.11574 \times 10^{-4} \text{ weeks}$

2) Convert 75.000 miles/hour into meters/second.

$$V = \frac{75 \text{ miles}}{1 \text{ hr}} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} \cdot \frac{1 \text{ hr}}{3600 \text{ sec}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{2.540 \text{ cm}}{1 \text{ in}} \cdot \frac{1 \text{ m}}{100 \text{ cm}}$$

$$V = \frac{(75)(5280)(12)(2.54) \text{ m}}{(3600)(100) \text{ s}} = \frac{(66)(2.54)}{5} = \frac{4191}{125}$$

$V = \frac{4191 \text{ m}}{125 \text{ s}}$   
 or  
 $V = 33.528 \frac{\text{m}}{\text{s}}$

3) Convert 1.00 kilometers/hour into miles/week.

$$V = \frac{1 \text{ km}}{1 \text{ hr}} \cdot \frac{1000 \text{ m}}{1 \text{ km}} \cdot \frac{24 \text{ hr}}{1 \text{ day}} \cdot \frac{7 \text{ days}}{1 \text{ week}} \cdot \frac{100 \text{ cm}}{1 \text{ m}} \cdot \frac{1 \text{ in}}{2.54 \text{ cm}} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft}}$$

$V = \frac{437,500 \text{ mi}}{4191 \text{ wk}} \approx 104.39036 \frac{\text{mi}}{\text{wk}}$

4) Convert 30 revolutions into degrees.

$$\phi = \frac{30 \text{ rev}}{1} \cdot \frac{360^\circ}{1 \text{ rev}} = 10800^\circ$$

$\phi = 10,800^\circ$

5) A rectangular solid steel bar has a length of 1.000 meter, a width of 3.000 inches and a height of 2.000 feet. Determine its volume in cubic centimeters.

$$\text{Vol} = lwh = \frac{1 \text{ m}}{1} \cdot \frac{3 \text{ in}}{1} \cdot \frac{2 \text{ ft}}{1} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{100 \text{ cm}}{1 \text{ m}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}}$$

$$\text{Vol} = (3)(2)(12)(100)(2.54)(2.54) \text{ cm}^3 = 46451.52 \text{ cm}^3$$

$\text{Vol} = \frac{1,161,288}{25} \text{ cm}^3 \text{ or } 46,451.52 \text{ cm}^3$