Completing Conversions Through Dimensional Analysis

Dimensional Analysis is a useful way of completing conversion problems.

This method of problem solving allows you to solve many problems by using the <u>relationship</u> of one unit to another.

For example,
1 day = 24 hours.
Since these two numbers represent the same value, the fractions:

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<u>1 day</u> and <u>24 hours</u> equal <u>ONE</u> 24 hours 1 day

When you multiply a number by the number one, you do not change its value.

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However, you may change its <u>unit</u>.

1) Convert 3 hours to days using dimensional analysis.

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 $3 \text{ hours } \times \frac{1 \text{ day}}{24 \text{ hour}} = \frac{3 \text{ day}}{24} = 0.125 \text{ day}$

Dimensional Analysis Conversion Factors 1 day = _24__ hours \sim 1 hour = <u>60</u> minutes $\sim 1 \text{ minute} = 60 \text{ seconds}$

Dimensional Analysis Conversion Factors 1 mile = <u>5280</u> feet \sim 1 foot = <u>12</u> inches $\sim 1 \text{ meter} = 100 \text{ centimeters}$ 1 meter = 1000 millimeters

Dimensional Analysis Conversion Factors \sim 1 kilometer = <u>1000</u> meters \sim 1 inch = <u>2.54</u> centimeters 1 mile = <u>1.609</u> kilometers

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2) 3 miles = ? inches

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3) 852 m = ? km

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4) 74 km = ? cm

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5) 7 days = ? seconds



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6) 10 km = ? miles

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7) 6 km/hr = ? km/s

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Dimensional Analysis 8) 55 miles/hour = ? feet/second