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1. How many feet are in 30 inches?

$$(30 \text{ inches}) \cdot \left(\frac{1 \text{ foot}}{12 \text{ inches}}\right) = 2.5 \text{ feet}$$

2. Three yards is how many centimeters?

$$3 \text{ yards} = (3 \text{ yards}) \cdot \left(\frac{3 \text{ feet}}{1 \text{ yard}}\right) \cdot \left(\frac{12 \text{ inches}}{1 \text{ foot}}\right) \cdot \left(\frac{2.54 \text{ centimeters}}{1 \text{ inch}}\right)$$

$$= 274.32 \text{ centimeters}$$

3. (TRIGONOMETRY) How many radians are in 3 complete revolutions?

$$(3 \text{ revolutions}) \cdot \left(\frac{2\pi \text{ radians}}{1 \text{ revolution}}\right) = 6\pi \text{ radians}$$

4. (PHYSICS) A train is traveling at 60 miles per hour. The brakes are applied and the train comes to a complete halt in 30 seconds. Find the rate of deceleration in feet per second squared.

$v = v_o + at$ *(the formula to use)*

$0 = \left(\frac{60 \text{ miles}}{1 \text{ hour}}\right) + a \cdot (30 \text{ seconds})$ *(solving for a in this equation yields)*

$$a = -\left(\frac{60 \text{ miles}}{1 \text{ hour}}\right) \cdot \left(\frac{1}{30 \text{ seconds}}\right)$$

$$a = -\left(\frac{60 \text{ miles}}{1 \text{ hour}}\right) \cdot \left(\frac{1}{30 \text{ seconds}}\right) \cdot \left(\frac{5280 \text{ feet}}{1 \text{ mile}}\right) \cdot \left(\frac{1 \text{ hour}}{60 \text{ minutes}}\right) \cdot \left(\frac{1 \text{ minute}}{60 \text{ seconds}}\right)$$

$a = -2.93 \, ft/s^2$

5. (CHEMISTRY) Liquid mercury has a density of 13.6 g/ml at 20°C. Find the mass in kilograms of 804 liters of mercury at 20 degrees Celsius.

$\text{mass} = (\text{density}) \cdot (\text{volume})$ *(replacing the given values into this formula yields)*

$$= \left(\frac{13.6 \text{ grams}}{1 \text{ milliliter}}\right) \cdot \left(\frac{804 \text{ liters}}{1}\right)$$

$$= \left(\frac{13.6 \text{ grams}}{1 \text{ milliliter}}\right) \cdot \left(\frac{804 \text{ liters}}{1}\right) \cdot \left(\frac{1000 \text{ milliliters}}{1 \text{ liter}}\right) \cdot \left(\frac{1 \text{ kilogram}}{1000 \text{ grams}}\right)$$

$$= 10{,}934.4 \text{ kg}$$