

Dimensional Analysis Practice

Name:

These are meant to be basic dimensional analysis problems. I realize some of the problems may seem very easy, but the object of this exercise is to show that you know how to work your way through the problem, showing work. As we go through the class, problems will continually get more difficult to the point where if you do not know how to write out the problems, showing unit cancellation, you will get lost in the problem. Use the equalities listed below to help you solve the problems.

Again, show your work to receive credit as has been modeled in class. Also show units cancelling. Make sure to use significant digits.

$$1 \text{ gallon} = 4 \text{ quarts}$$

$$2.54 \text{ cm} = 1 \text{ inch}$$

$$16 \text{ cups} = 1 \text{ gallon}$$

$$10 \text{ milli} = 1 \text{ centi}$$

$$100 \text{ centi} = 1 \text{ base}$$

$$1000 \text{ base} = 1 \text{ kilo}$$

$$1 \text{ cm}^3 = 1 \text{ ml}$$

$$1 \text{ gallon} = 3.786 \text{ L}$$

$$1 \text{ pound} = 454 \text{ g}$$

$$16 \text{ ounces} = 1 \text{ pound}$$

$$1.609 \text{ km} = 1 \text{ mile}$$

$$1 \text{ mile} = 5280 \text{ feet}$$

1. Convert 3598 g into pounds.
2. Convert 231 g to ounces.
3. If a beaker contains 578 ml of water, what is the volume in quarts?
4. How many milligrams are in 5.25×10^{-13} kg?

5. What is 7.86×10^{-2} kL converted to liters?

6. What is 0.0032 gallons converted to centiliters?

7. A box has a length of 3.12 feet, a width of 0.0455 yards, and a height of 7.87 inches, what is the volume of the box in cubic centimeters?

8. If a block of wood has a volume of 0.2587 ft^3 , what is the volume in cubic millimeters?

9. If you are travelling at 55 mph in a car, what is your speed in meters per second (m/s)?

10. If the density of an object is $2.87 \times 10^{-4} \text{ lbs./in}^3$, what is its density in g/mL?