

Math Review and Conversion Practice

Name _____

Date _____ Period _____

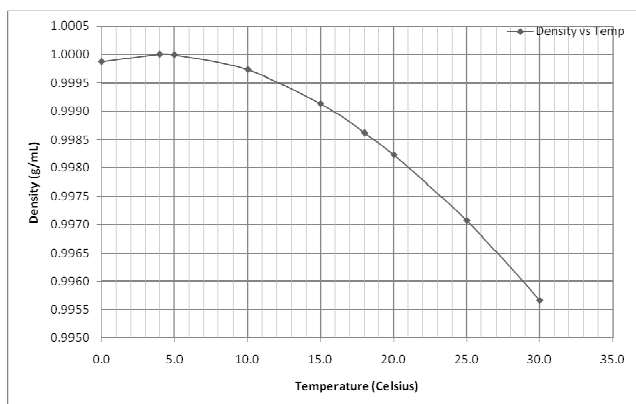
1. Change each decimal to a percent or percent to a decimal.

- a. .32 b. .006 c. .0015
 d. .4% e. 19% f. .23%

2. Solve the following:

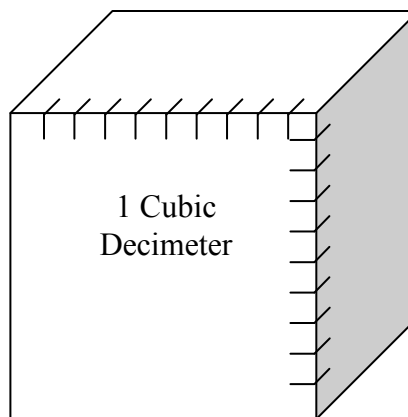
- a. 18 is what percent of 45?
 b. What percent of 25 is 10?
 c. 15 is 20% of what number?
 d. What is 250% of 12?
 e. 70% of what number is 35?
 f. What is the percent decrease from 200 to 180?
 g. What is the percent increase in rainfall from Jan. (2.5") to Feb. (4.0")

3. Given the graph below of the density of water as a function of temperature:



- a) At what temperature is the water the densest?
 b) At what temperature is the water density *changing* the slowest?
 c) How many digits of precision for density and temperature can be reported from information on this graph?
 d) What is the density of the water at 288.15K?

4. The figure below represents a cube with a volume of one cubic decimeter. Given that the mass density of water at exactly 3.98°C is exactly 1 kg/L, answer the following:



- a. The length of one side of the cube is
 _____ dm = _____ cm
- b. The combined area of all the sides of this cube is
 _____ dm² = _____ m²
- c. The volume of the cube is
 _____ L = _____ cm³
- d. The mass of such a volume of water at 3.98°C is
 _____ kg = _____ mg

5. Solve the following:

a. Express the sum of 50.7mm, 47.5cm and 8.01m in meters.

_____m

b. Express 1.549 μ m (micrometers) in km.

_____km

c. Given $PV = nRT$, solve for n

d. Given $Fd = mv^2/2$, solve for v

e. Given $L = L_0(1 - v^2/c^2)$, solve for L_0

f. Given $xy/m = (R + t)/2$, solve for m

g. Given $F = Gm_1m_2/r^2$, solve for m_1 .

h. What happens to F in the above equation if r is reduced to 1/2 its original value (assume all other values are constant).

i. Compute and determine final units for
$$\frac{(1.2 \times 10^{-2} \text{cm} + 2.1115 \text{cm} - .1 \text{cm})(6.997 \text{g})}{(.0300 \text{cm}^3)}$$

6. Suppose you obtain the following data for a measurement:

Trial	Mass
1	23.26g
2	23.18g
3	22.95g

If the accepted value for the mass is 23.20g find:

a. the relative error for Trial 3
 $| \text{accepted} - \text{measured} | / \text{accepted}$

b. the absolute error for Trial 1
 $\text{measured} / \text{accepted}$

c. the average mass of the three trials.

7. Perform the following conversions in the order given showing conversion ratios and dimensional analysis:

Example: Convert 5.3in/s to yds/hr via
in/s \rightarrow ft/s \rightarrow yds/s \rightarrow yds/min \rightarrow yds/hr

Answer:

$$5.3 \text{in/s} (1 \text{ft}/12 \text{in})(1 \text{yd}/3 \text{ft})(60 \text{s}/1 \text{min})(60 \text{min}/1 \text{hr}) = 5.3 \times 10^2 \text{yds/hr}$$

a. Convert 50.23mi to cm via
mi \rightarrow ft \rightarrow in \rightarrow cm

b. Convert .298ft/s to m/hr via
ft/s \rightarrow in/s \rightarrow cm/s \rightarrow m/s \rightarrow m/min \rightarrow m/hr

c. Convert $2.44 \times 10^{-3} \text{kg m/s}^2$ to g cm/s^2 via
 $\text{kg m/s}^2 \rightarrow \text{g m/s}^2 \rightarrow \text{g cm/s}^2$

d. Convert $6.490 \times 10^3 \text{L/min}$ to ft^3/hr via
 $\text{L/min} \rightarrow \text{dm}^3/\text{min} \rightarrow \text{cm}^3/\text{min} \rightarrow \text{in}^3/\text{min} \rightarrow \text{ft}^3/\text{min} \rightarrow \text{ft}^3/\text{hr}$