1. What does directly proportional mean? when one variable increases the other variable increases

2. What does inversely proportional mean? when one variable increases the other variable decreases.

3. Is the graph above inverse or direct? Explain. inverse: temp increases pressure decreases

4. What is the independent variable? the variable that is not dependent on anything constant changing

5. What is the dependent variable? variable that is tested; depends on the independent

6. What axis represents the independent variable? x-axis

7. What axis represents the dependent variable? y-axis

8. In the graph above, what is the independent variable? temperature

9. In the graph above, what is the dependent variable? pressure

10. Determine the measurements below in the following:

4.29 cm or 4.30 cm

3.70 cm or 3.71 cm

4. 2.05 m
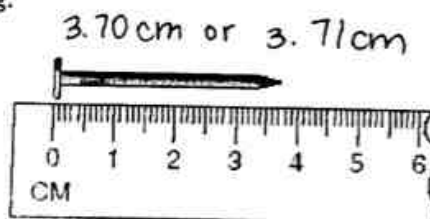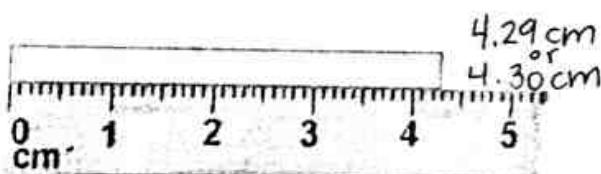
11. Identify the number of significant digits in each of the following measurements.

a. 520 mL __2__   b. 0.0120 ms __3__   c. 0.230 kg __3__   d. 2.560 x 10⁴ L __4__

e. 10.002ns __5__   f. 0.6451 Pa __4__   g. 0.0001cm __1__   h. 108,000 s __3__

10. Perform the following calculations and round to the correct number of sig figs:

a. 0.3287 cm x 45.2 cm = 14.85 (14.9 cm²)

d. 125.5 kg + 52.68 kg + 2.1kg = 180.28 = (180.3 kg)

b. $\frac{52.88 g}{11.2 mL}$ = 4.721 = (4.72 $\frac{g}{mL}$)

e. $\frac{333 m}{110 s}$ = 3.027 = (3.0 m/s)

c. 520 mm x 19.120 mm = 9942 = (9900 mm²)

f. 520g + 4500 + 5000 = 10020g

11. The mass of an object was recorded as 9.93 g, 9.90 g, and 10.02 g, using an electronic analytical balance. What is the average of these three masses expressed to the correct number of significant figures?

9.93g + 9.90 g + 10.02g = 29.85g /3= (9.95g)

12. Put these numbers into scientific notation

a. 0.0003240 3.240×10^{-4}

b. 645300 6.453×10^{5}

13. Describe Accuracy close/achieve goal or target

14. Describe Precision consistent

15.
Measurement 1: 5.2 g
Measurement 2: 5.4 g
Measurement 3: 3 g
Measurement 4: 2.45 g

These data show repeated measurements of the same object which has a known mass of 5.38 grams, Which measurement is most accurate? Measurement 2

16.
First measurement: 6.293 g
Second measurement: 6.294 g
Third measurement: 6.295 g

A student obtained these data after measuring the mass of an object three different times. If the true value of the object's mass is 5.550 g, these data are best described as — precise but not accurate

17. Calculate the density of unknown metal. The mass is 3.100 g and the volume is 1.05 mL. * remember sig figs

$$D = \frac{mass}{volume} = \frac{3.100g}{1.05mL} = \boxed{2.95 \frac{g}{mL}}$$

units

18. What is the formula for calculating % error?

$$\% \, error = \frac{|experimental - accepted|}{accepted} \times 100$$

19. Calculate the percent error for question 17, when the actual density of the unknown metal is 2.70 g/mL. * remember sig figs

$$\frac{|2.95 - 2.70|}{2.70} \times 100 = \frac{0.25}{2.70} \times 100 = 0.093 \times 100 = \boxed{9.3\%}$$

20. Convert the following:

a. 1 kilometer = 1000 m

b. 1 centimeter = 0.01 m

c. 1 millimeter = 0.001 m

d. 1.25 L = 1250 mL

e. 2340 mm = 0.002340 km

f. 42.32 mg = 4.232 cg

g. 950 g = 0.950 kg

h. 0.075 m = 7.5 cm

i. 6542 mL = 6.542 L

22. Lab based question: Calculate the density of the metal below. Volume of the metal was determined by water displacement.

* remember sig figs

Mass (g)	Initial Volume	Final Volume
23.432g	6.0 mL	8.2mL

volume of metal
2.2 mL

$$D = \frac{mass}{volume} = \frac{23.432g}{2.2mL} = \boxed{11 \frac{g}{mL}}$$