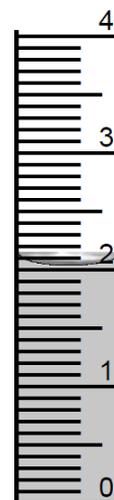
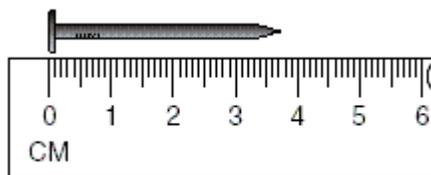


1. What does it mean when two variables are directly proportional?
2. What does it mean when two variables are inversely proportional?
3. Are the two variables in the graph to the left directly or inversely proportional? Explain your reasoning.

4. Define independent variable.
5. Define dependent variable.
6. Which axis represents the independent variable?
7. Which axis represents the dependent variable?
8. In the graph above, what is the independent variable?
9. In the graph above, what is the dependent variable?
10. Determine the measurements in each of the following:



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

- a) 520 mL _____ b) 0.0120 ms _____ c) 0.230 kg _____ d) 2.560×10^8 L _____
- e) 10.002 ns _____ f) 0.6451 Pa _____ g) 0.0001 cm _____ h) 108,000 s _____

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

- a) $0.3287 \text{ cm} \times 45.2 \text{ cm} =$ _____ d) $125.5 \text{ kg} + 52.68 \text{ kg} + 2.1 \text{ kg} =$ _____
- b) $\frac{52.88 \text{ g}}{11.2 \text{ mL}} =$ _____ e) $\frac{333 \text{ m}}{110 \text{ s}} =$ _____
- c) $520 \text{ mm} \times 19.120 \text{ mm} =$ _____ f) $520 \text{ g} + 4500 \text{ g} + 5000 \text{ g} =$ _____

13. 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?

14. Put these numbers into scientific notation

a) 0.0003240 _____

b) 645300 _____

15. Describe accuracy.

16. Describe precision.

17. 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?

18. 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 —

19. Calculate the density of an unknown metal. The mass of the metal is 3.100 g and the volume is 1.05 mL.

20. What is the formula for calculating % error?

21. Calculate the percent error for question 19, when the accepted density of the unknown metal is 2.70 g/mL.

22. Convert the following:

- a) 1 kilometer = _____ m b) 1 centimeter = _____ m c) 1 millimeter = _____ m
d) 1.25 L = _____ mL e) 2340 mm = _____ km f) 42.32 mg = _____ cg
g) 950 g = _____ kg h) 0.075 m = _____ cm i) 6542 mL = _____ L

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

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