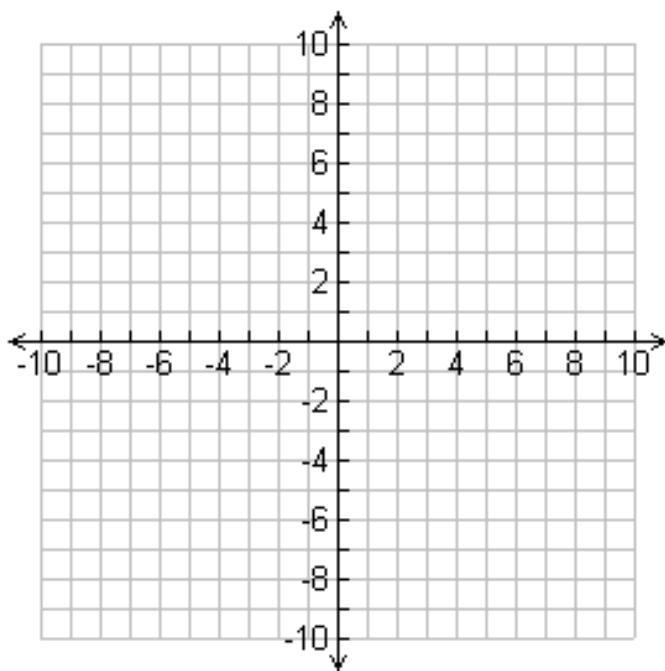


## **Homework: Ch 1**

1. Identify the number of significant figures in each number
  - a. 0.667
  - b. 200.3
  - c. 410.300
  - d. 0.00120
2. For each of the following numbers identify if the zeros shown are significant (S) or not significant (N).
  - a. 0.0120
  - b. 100.30
  - c. 100
3. Convert each number from standard notation into scientific notation.
  - a. 1125.625
  - b. 10000
  - c. 23400
4. Convert each number from scientific notation to standard notation.
  - a.  $1.26 \times 10^{-3}$
  - b.  $9.602572 \times 10^4$
  - c.  $4.006 \times 10^7$
5. Convert each of the following units to the value shown.
  - a. 256 kg = \_\_\_\_\_ g
  - b. 112.5 mm = \_\_\_\_\_ nm
  - c. 26 ft = \_\_\_\_\_ inches
  - d. 2.76 hr = \_\_\_\_\_ sec
  - e. 0.325 years = \_\_\_\_\_ sec
6. What is the difference between precision and accuracy?
7. How do you determine the uncertainty in a set of measurements?
8. What is the difference between a theory and a law?
9. What is the area of square which has one side of 3.15 cm? Express your answer in meters.
10. What is the area of circle which has a diameter of 3.25 cm? Express your answer in meters.

11. The Earth is roughly a sphere, with a radius of  $6.37 \times 10^6$  m. What is the radius of the Earth in km? What is the surface area of the Earth? What is the volume of the Earth?
12. The Earth has a mass of  $5.98 \times 10^{24}$  kg. The average mass of the atoms that make up the Earth is 40 u, where  $1 \text{ u} = 1.661 \times 10^{-27}$  kg. How many atoms make up the Earth?
13. The sides of a small rectangular box are measured to be  $1.80 \pm 0.01$  cm,  $2.05 \pm 0.02$  cm, and  $3.1 \pm 0.1$  cm long. Calculate its volume and uncertainty in cubic centimeters.
14. Solve each equation for  $x$ .
- $C = 2\pi x^3$
  - $U = \frac{1}{2}kx^2$
  - $x^2 + y^2 = z^2$
  - $2 \cos(3x) = b$
  - $v^2 = v_0^2 + 2a(x - x_0)$
15. Solve the following systems of equations to determine values for  $x$  and  $y$ .
- $x + y = 10$  and  $y - x = 4$
  - $y = 0.625x + 0.25$  and  $-21.75x = 6y - 10$
16. Write each of the following numbers in decimal form.
- $\frac{1}{2}$
  - $\frac{3}{4}$
  - $\frac{1}{4}$
17. Calculate the following fractions and to reduce to the lowest form (no decimals).
- $\frac{1}{2} + \frac{3}{8} =$
  - $\frac{1}{4} \times \frac{5}{7} =$
  - $\frac{3}{4} \div \frac{7}{8} =$
  - $\frac{x}{4} + \frac{x^2}{8} =$
  - $\frac{x^3}{2x} =$
18. Determine the sine and cosine of the following angles.
- $60^\circ$
  - $30^\circ$
  - $45^\circ$
19. A right triangle has a side of length 6.0 cm and another side of length 3.5 cm. Determine the hypotenuse of this triangle. Hint: Try the Pythagorean Theorem.

20. Graph and label each of the following points on the graph below:  $A = (2, 3)$ ;  $B = (1, -1)$ ;  $C = (-3, -10)$ ;  $D = (2, -9)$ ;  $E = (-4, 3)$ ;  $F = (0, 7)$



21. For the line shown on the graph below, find the slope.

