Chapter 3 & 4 Pretest (+1) Name _____

Section 3.1 THE IMPORTANCE OF MEASUREMENT

1. Describe each of the following statement as qualitative or quantitative.
   a) The time is now 7:00 pm.
   b) It is cold outside.
   c) It's getting late.
   d) The temperature is four degrees Fahrenheit.

2. Jim has 2×10^3 marbles. Bill has 3×10^2 marbles. Who has more marbles, Jim or Bill?

3. One mile equals 1609 meter. Express this measurement using scientific notation.

4. An oval track is 400 meters long. Express this measurement using scientific notation.

5. Add the answers to problem 3 and 4, and express the sum using scientific notation.

6. Multiply the answers to problem 3 and 4 and express the product using scientific notation.

7. Subtract 2.5×10^4 from 5.00×10^5 and express the answer using scientific notation.

8. Divide 5.00×10^5 by 2.5×10^4 and express the answer using scientific notation.

Section 3.2 UNCERTAINTY IN MEASUREMENTS:

1. Bruce's three measurements are 19 cm, 20 cm, and 22 cm. Calculate the average value of his measurements and express the answer with the correct number of significant figures.

2. Pete's three measurements are 20.9 cm, 21.0 cm, and 21.0 cm. Calculate the average value of his measurements and express the answer with the correct number of significant figures.

3. Multiply the answer to problem 1 by the answer to problem 2. Express the answer in scientific notation with the correct number of significant figures.

4. Whose measurements are more precise?

5. The actual length of the object is 20 cm. Whose measurements are more accurate?

6. What is the error of Pete's average measurement?

7. What is the percent error of Pete's average measurement?

8. Four boards each measuring 1.5 m are laid end to end. Multiply to determine the combined length of the boards, expressed with the correct number of significant figures.

Section 3.3 THE INTERNATIONAL SYSTEM OF UNITS

A fish tank measures 0.40 meter long by 0.20 meter wide by 0.30 meter high.

1. What is the width of the tank in centimeters?

2. What is the length of the tank in millimeters?

3. What is the volume of the tank in liters?

4. What is the mass of water, in grams, that would fill the tank halfway?

5. An astronaut in her spacesuit weighs 300 lb on earth. What would her weight be on the moon?

6. How many nanoseconds are there in one minute?

Section 3.4 DENSITY *Use the data in Table 3.7 to solve problem 1-6*

1. What is the mass at 20 C of five liters of air?

2. A balloon filled with air is released in a room filled with carbon dioxide. Will the balloon float to the ceiling or sink to the floor?

3. One kilogram of water has a volume of one liter at 4 C. What is the volume in liters of a kilogram of ice at 0 C?

4. What is the mass of a bar of aluminum measuring 1.0 cm by 1.0 cm by 10.0 cm?

5. Using water as the reference substance, what is the specific gravity of ethanol at 20 C? (Assume the density of water at 20 C is 1.00 g/cm^3)

6. Using air as the reference substance, what is the specific gravity of carbon dioxide at 20 C?

7. An object measuring 4.0 cm by 2.5 cm by 5.0 cm has a mass of 110 grams. What is the density of the object?

Section 3.5 TEMPERATURE

1. Most chemical reactions are done at 20 C. What is this temperature in Kelvins?

2. A slurry of dry ice in acetone has a temperature of –78 C. What is this temperature in Kelvins?

3. How is absolute zero expressed on the Celsius scale?

4. Water freezes at 32 F and boils at 212 F. What temperature on the Fahrenheit scale is equal to 50 C?

5. A typical refrigerator keeps food at 277 K. What is this temperature in degrees Celsius?