Name KEY Date _____ Class 1ST Qt. 14

3 SCIENTIFIC MEASUREMENT

Practice Problems

In your notebook, solve the following problems.

SECTION 3.1 MEASUREMENTS AND THEIR UNCERTAINTY

Using different rulers, Bruce and Pete each measure the length of the same object three times.

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. 20 cm
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. 21.0 cm
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. 4.2×10^2 cm^2
4. Whose measurements are more precise? Pete's
5. The actual length of the object is 20 cm. Whose measurements are more accurate? Bruce's
6. What is the error of Pete's average measurement? 1 cm
7. What is the percent error of Pete's average measurement? 5%
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. 6.0 m

SECTION 3.2 THE INTERNATIONAL SYSTEM OF UNITS (SI)

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? 20 cm
2. What is the length of the tank in millimeters? 400 mm
3. What is the volume of the tank in liters? 24 L
4. What is the mass of water, in grams, that would fill the tank halfway? 12,000 g
5. An astronaut in her spacesuit weighs 300 lb on Earth. What would her weight be on the moon? 50 lb
6. How many nanoseconds are there in one minute? 6×10^{10} ns
7. A chemical reaction takes place at 20°C. What is this temperature in kelvins? 293 K
8. A typical refrigerator keeps food at 277 K. What is this temperature in degrees Celsius? 4°C