

Chemistry 11: Measurement Review

Name: KEY

1. Indicate the number of significant figures in each of the following measurements:

- | | | | |
|--------------|----------|----------------------------|----------|
| a) 1.30 mL | <u>3</u> | d) 0.040 cm | <u>2</u> |
| b) 3.51 g | <u>3</u> | e) 3×10^6 m | <u>1</u> |
| c) 10.2146 g | <u>6</u> | f) 2.2×10^{-2} cm | <u>2</u> |

2. Convert the following measurements to standard scientific notation. Each is shown to the correct number of significant figures.

- | | |
|----------------|--------------------------------------------|
| a) 627.0 mm | <u>6.270×10^2 mm</u> |
| b) 0.001 640 g | <u>1.640×10^{-3} g</u> |
| c) 1823.10 km | <u>1.82310×10^3 km</u> |

3. Complete the following calculations and show each answer to the proper number of significant figures. Include the correct units in your answers.

- | | |
|---------------------------------------------------------------------------|------------------------------------------------|
| a) 1.620 L + 17.10 L | <u>18.72 L</u> |
| b) 2.71 mL - 2.425 mL | <u>0.28 mL or 0.29 mL</u> |
| c) 25.8 L / 2.334 L | <u>11.0 or 11.1</u> |
| d) 67.15 cm x 12.5 cm ² | <u>839 cm³</u> |
| e) (1.32 cm) ³ | <u>2.30 cm³</u> |
| f) $(11.3 \times 10^2 \text{ cm}) \times (5.4 \times 10^{-3} \text{ cm})$ | <u>6.1 cm²</u> |
| g) $(6.1 \times 10^3 \text{ m}) - (5.3 \times 10^4 \text{ m})$ | <u>$-4.7 \times 10^4 \text{ m}$</u> |

4. Round off as indicated.

- | | |
|------------------------------------------------|-----------------------------------|
| a) 3.5 g to 1 significant figure | <u>4g</u> |
| b) 4.721×10^3 to the nearest thousand | <u>5×10^3</u> |
| c) 0.12351 ml to 3 significant figures | <u>0.124 mL</u> |

5. A rectangular piece of zinc foil has a length of 18.4 cm, a width of 15.5 cm and a mass of 0.70 g. The density of zinc is 6.30 g/cm^3 . Calculate the thickness of the zinc. Show all work, and report the answer to the correct number of significant figures, in standard scientific notation.

$$A = 18.4 \text{ cm} \times 15.5 \text{ cm} = 285.2 \text{ cm}^2 \quad (\text{carrying an extra digit})$$

$$V = \frac{\text{Mass}}{D} = \frac{0.70 \text{ g}}{6.30 \text{ g/cm}^3} = 0.11 \text{ cm}^3$$

$$T = \frac{V}{A} = \frac{0.11 \text{ cm}^3}{285.2 \text{ cm}^2} = 3.9 \times 10^{-4} \text{ cm}$$

6. In an experiment to determine the density of an unknown liquid, 5 people obtained the following results:

	<u>Volume (mL)</u>	<u>Mass (g)</u>
1.	1.6	3.01
2.	2.8	5.39
3.	5.0	9.82
4.	8.2	14.81
5.	9.7	18.43

- a) Prepare a properly labelled graph of the data on graph paper. Use volume as the independent variable.

- b) What is the slope of the graph to 3 significant figures? Show your work! — See graph!

$$\text{Slope} = \frac{11.6}{6.00 \text{ mL}} = 1.93 \text{ g/mL} \quad 1.93 \text{ g/mL}$$

- c) What is the equation of the relationship obtained above?

$$\text{mass} = 1.93 \text{ g/mL} \times \text{volume}$$

$$(y = mx + b \text{ so mass} = \text{slope} \times \text{volume} + y\text{-intercept})$$

- d) What will be the volume of 275.5 g of the liquid? Show your work!

$$275.5 \text{ g} \div 1.93 \text{ g/mL} = 143 \text{ mL}$$

MASS OF LIQUID VERSUS VOLUME OF LIQUID

