

Name: _____

Math Essentials

1. To the correct number of significant figures, record the measurement of the black line:



2. Give the number of significant figures in each of the following measurements:

c. 30,406 cm _____

j. 2.00×10^{-3} mL _____

d. 0.003040 g _____

k. 30 m _____

e. 3,005 kg _____

l. 4.12×10^5 cm³ _____

f. 270 pairs _____

m. 0.00078 mg _____

g. 0.20 mm _____

n. 22.70 cm _____

h. 105,000 s _____

o. 0.176 m/s _____

i. 13,030 L _____

p. 52 pencils _____

3. Express the following numbers in scientific notation with the correct number of significant figures and units:

a. 9,457 km _____

f. 0.000670 g _____

b. 0.00007 cm _____

g. 332,080,000 L _____

c. 21,000 s _____

h. 0.0002383 cg _____

d. 0.01234 mg _____

i. 0.3048 ms _____

e. 652.38 mL _____

j. 300 m _____

4. Round the following measurements to three significant figures:

a. 33.85 g _____

g. 32.55 L _____

b. 137,928 mm _____

h. 45.651 m _____

c. 4,575 s _____

i. 45.650 m _____

d. 0.30333 mL _____

j. 289.7 s _____

e. 3.996 cm _____

k. 99,950 km _____

f. 33.73 kg _____

l. 344,500 mm _____

5. Perform the following calculations and report answers with the correct number of significant figures:

a. $23.098 \text{ cm} + 0.040 \text{ cm} + 2,300.0 \text{ cm} =$ _____

b. $450,600 \text{ L} - 0.4030 \text{ L} =$ _____

c. $(2300 \text{ mm})(2.3080 \text{ mm}) =$ _____

d. $(0.00340 \text{ km})(3.4 \times 10^{-5} \text{ km}) =$ _____

e. $(2.03 \times 10^{-6} \text{ m})(3.0 \times 10^7 \text{ m})(3.500 \times 10^{-2} \text{ m}) / 23.00 \text{ m} =$ _____

f. $201.2 \text{ kg} + 31.37 \text{ kg} =$ _____

g. $410 \text{ s} - 22 \text{ s} =$ _____

h. $191 \text{ g} - 12.32 \text{ g} =$ _____

i. $19.31 \text{ m} / 0.107 \text{ s} =$ _____

6. Calculate the following conversions using dimensional analysis (see common unit conversions sheet):

a. $47.0 \text{ in} = ? \text{ ft}$

b. $2.30 \text{ mi} = ? \text{ km}$

c. $4.75 \text{ hr} = ? \text{ min}$

d. $87.0 \text{ min} = ? \text{ days}$

e. $24.5 \text{ mi/hr} = ? \text{ km/min}$

f. $62.0 \text{ s/yd} = ? \text{ hr/ft}$

g. $734 \text{ s} = ? \text{ years}$

h. $95.0 \text{ mm} = ? \text{ yd}$

7. Perform the following metric conversions (use metric conversion factors from notes):

a. $3.614 \text{ mg} = ? \text{ g}$

b. $760 \text{ g} = ? \text{ kg}$

c. $14.4 \mu\text{m} = ? \text{ mm}$

d. $6.03 \times 10^{-6} \text{ cg} = ? \text{ ng}$

e. $12 \text{ km} = ? \text{ nm}$

f. $6.4 \text{ mg} = ? \text{ pg}$

g. $7.6 \text{ dm} = ? \text{ Mm}$

h. $5.6 \times 10^3 \text{ cm} = ? \text{ m}$

Common Unit Conversions

Length

$$1 \text{ in} = 2.54 \text{ cm}$$

$$1 \text{ mi} = 1.61 \text{ km}$$

$$12 \text{ in} = 1 \text{ ft}$$

$$3 \text{ ft} = 1 \text{ yd}$$

$$5280 \text{ ft} = 1 \text{ mi}$$

Mass

$$1 \text{ lb} = 454 \text{ g}$$

$$16 \text{ oz} = 1 \text{ lb}$$

$$2000 \text{ lb} = 1 \text{ ton}$$

Volume

$$1 \text{ L} = 1.06 \text{ qt}$$

$$2 \text{ pints} = 1 \text{ qt}$$

$$4 \text{ qt} = 1 \text{ gal}$$

$$1 \text{ mL} = 1 \text{ cm}^3$$

Density

$$d = m/V$$

$$V = l \times w \times h$$

$$d_{\text{H}_2\text{O}} = 1.0 \text{ g/cm}^3$$

Temperature

$$K = ^\circ\text{C} + 273$$

$$^\circ\text{F} = (^\circ\text{C} \times 1.8) + 32$$