Name _____

Date _____

Multiplication with units. Use a calculator. Your answer should have units written as one or more words. Round to correct sig figs

$\dfrac{75\ cm}{} * \dfrac{3.5\ cm}{12.87\ liters} = $ **20.** $\frac{cm^2}{L}$	$\dfrac{1.2\ grams}{} * \dfrac{1\ mL}{11.7\ grams} = $
$\dfrac{91.2\ grams}{} * \dfrac{117\ pretzels}{594.4\ grams} = $	$\dfrac{1.2\ grams}{} * \dfrac{11.7\ grams}{1\ mL} = $

strategy top times top divided by bottom

I. Numbers that are in a relationship (use your common sense)

a.	**12** EGGS = **1** DOZENS	d. _____ mL = _____ liters
b.	**2** EYES = **1** HUMAN	e. _____ kilometers = _____ millimeters
c.	_____ LEGS = _____ SPIDER	f. _____ yards = _____ football field

II. Rewrite the six numbers-in-relationships from above as ratios there are two versions of each, one an upside down version of the other.

a. ratios for eggs and dozens could be $\left(\dfrac{1\ dozen}{12\ eggs}\right)$ or $\left(\dfrac{12\ eggs}{1\ dozen}\right)$

b. ratios for eyes and humans could be $\left(\dfrac{\quad}{\quad}\right)$ or $\left(\dfrac{\quad}{\quad}\right)$

c. ratios for mL and liters could be $\left(\dfrac{\quad}{\quad}\right)$ or $\left(\dfrac{\quad}{\quad}\right)$

d. ratios for yards and fields could be $\left(\dfrac{\quad}{\quad}\right)$ or $\left(\dfrac{\quad}{\quad}\right)$

III. Insert one of your ratios from above into each equation below in a way that the units will cancel. Use a calculator to write an answer that has correct UNITS and sig figs.
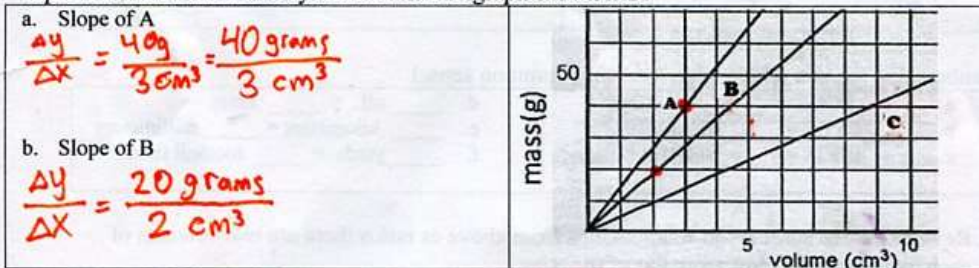
a. 225 eggs $\times \left(\dfrac{1\ dozen}{12\ eggs}\right) = $ **18.75 dozen**

b. 13 humans $\times \left(\dfrac{2\ eyes}{1\ human}\right) = $ **26 eyes**

c. 9.90 liters $\times \left(\dfrac{\quad}{\quad}\right) = $

d. 55 football fields $\times \left(\dfrac{\quad}{\quad}\right) = $

15. Estimate the level of liquid in the four containers. Remember: read between the lines and add only ONE MORE digit

 40 / 30 / 20   28 / 27 / 26   26.6 / 26.5 / 26.4   50 mL / 45 mL / 40 mL / 35 mL / 30 mL

__26__   __26.4__   _____
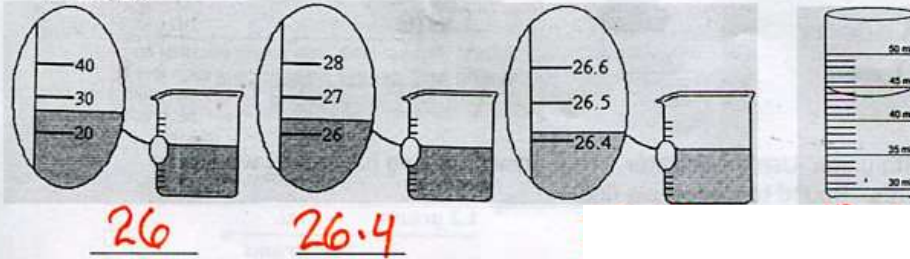
V. Equalities based on metric system and on the graph shown here:

a. Slope of A

$$\frac{\Delta y}{\Delta x} = \frac{40g}{3cm^3} = \frac{40\ grams}{3\ cm^3}$$

b. Slope of B

$$\frac{\Delta y}{\Delta x} = \frac{20\ grams}{2\ cm^3}$$

mass (g)   50   A   B   C   5   10   volume (cm³)

V. Use your two slopes from the graph to write ratios

a. Two ways to write a ratio based on the Slope of Line A are

$$\left(\frac{40\ grams}{3\ cm^3}\right)\ or\ \left(\frac{3\ cm^3}{40\ grams}\right)$$

b. Two ways to write a ratio based on the Slope of Line B are

$$(\text{————})\ or\ (\text{————})$$

c. Two ways to write a ratio based on the Slope of Line C are

$$(\text{————})\ or\ (\text{————})$$

VI Insert one of your ratios from above into each equation below in a way that the units will cancel. Use a calculator to write an answer that has correct UNITS and sig figs.

a. 225 cm³ of "A" $\times \left(\dfrac{40\ grams}{3\ cm^3}\right) =$ 3000 grams

c. 0.48 g of "B" $\times \left(\text{————}\right) =$

d. 1.65 cm³ of "B" $\times \left(\text{————}\right) =$

b. 4.50 g of "A" $\times \left(\text{————}\right) =$