Key

Unit One Test Review

1. Determine the number of significant figures in the following:
   a. 2.035 → 4 (this zero counts because there are non-zero's on either side)
   b. 0.00002 → 1 (zero's to the left of non-zero's (leading zero's) never count)
   c. 2300 → 2 (trailing zero, (zero's to the right of non-zero's) only count when there is a decimal anywhere in the #)
   d. 100.0 → 4 (trailing zero's count when there is a decimal place in the number)

2. Convert the following to scientific notation:
   a. 23000000000000 2.3×10^{13}
   b. 0.000000005398 5.398×10^{-9}

3. Convert the following (include the correct number of significant figures, units, and show work):
   a. 52 ng= _____ cg

$$\frac{52\,ng}{} \cdot \frac{1\ g}{1\times10^{9}\ ng} \cdot \frac{100\ cg}{1\ g} = 5.2\times10^{-6}\ cg$$

   b. 0.05 kL= _____ mL

$$\frac{0.05\,kL}{} \cdot \frac{1000\ L}{1\ kL} \cdot \frac{1000\ mL}{1\ L} = 5\times10^{4}\ mL$$

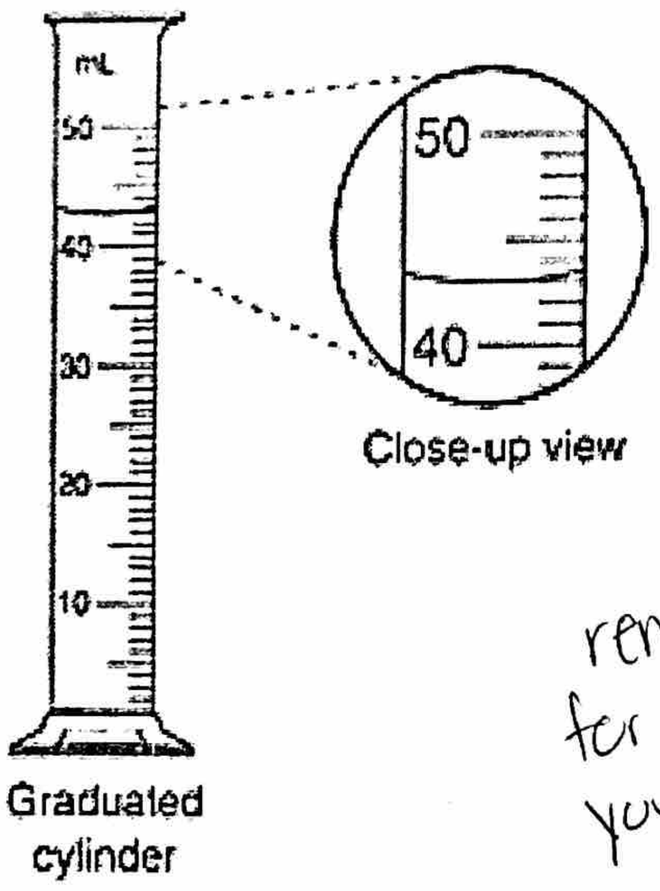
4. What is the density of a piece of metal that has a mass of 23.58 g and a volume of 3.00 mL? What metal is this?

$$D = \frac{m}{V} = \frac{(23.58g)}{3.00mL} = 7.86\,g/mL$$

make sure you follow sig fig rules for your final answer and always include units

Iron

Use the measuring tools/graphics on the left hand side to answer the questions on the right.



5. Measure the amount of liquid in the graduated cylinder and provide the uncertainty in the measurement.

certain, estimated

43.0 mL ± .1

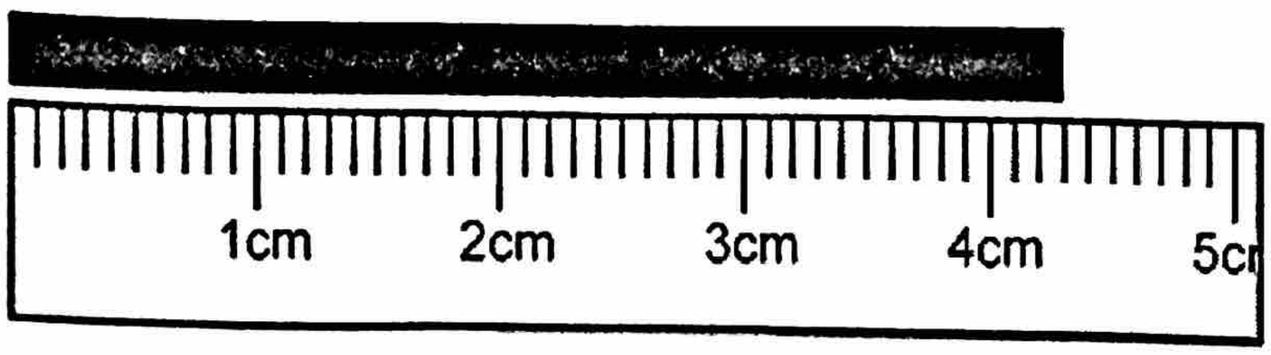
so uncertainty has "1" in tenth spot

remember, for uncertainty, you put a ± after your measurement and put a "1" in the spot of your estimated digit

6. A graduated cylinder has 1.53 mL of water, what is the uncertainty of the cylinder?

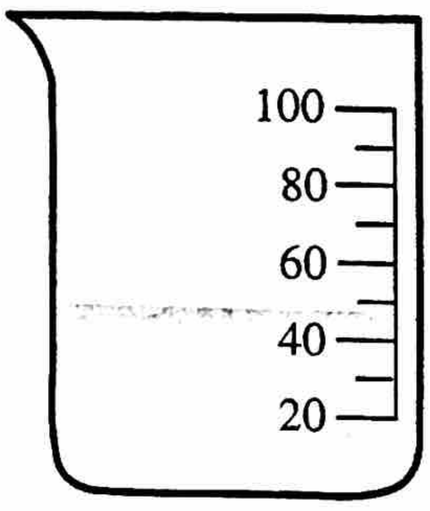
± .01

*assume the last digit is estimated since that is how we learned to measure



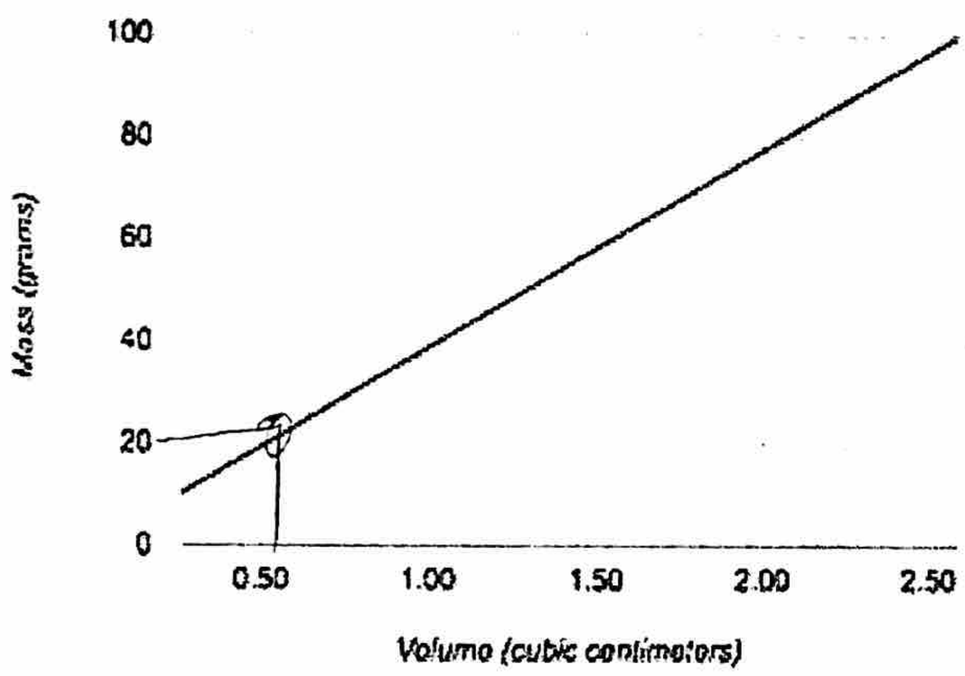
7. How long is the line above the ruler? what is the uncertainty?

4.30 cm ± .01



8. How much liquid is in the beaker? What is the uncertainty?

48 mL ± 1

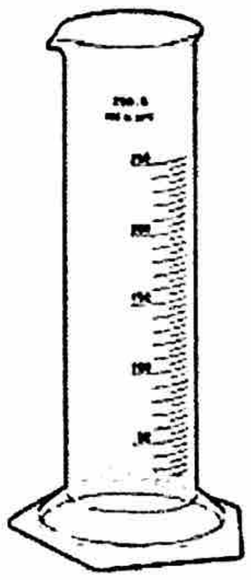


9. Determine the density from graph provided.

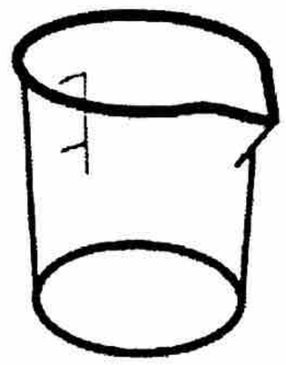
$D = m/V$

$= (20g)/0.50\ cm^3$

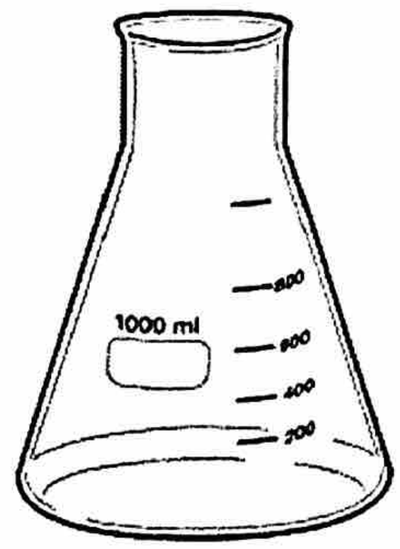
$= 40\ g/cm^3$



graduated cylinder



beaker



erlenmeyer flask

10. What lab equipment is shown in the picture to the left?

Answers

1. Significant figures:
    a. 4
    b. 1
    c. 2
    d. 4
2. Scientific notation
    a. 2.3×10^{13}
    b. 5.398×10^{-9}
3. Conversions
    a. 5.2×10^{-6} cg
    b. 5×10^{4} mL
4. 7.86 $\frac{g}{mL}$, Iron
5. 43.1 mL , ±.1
6. ± .01 mL
7. 4.31 cm, ±.01
8. 48 mL, ±1
9. 40 g/cm^3
10. graduated cylinder, beaker, erlenmeyer flask