Name: _____ Block: ___ Date: _____
Homework – Significant Figures and Scientific Notation

Determine the number of significant figures for each of the following.

1.	5.432	___	6.	40.319	5	11.	146	___	16.	3.285	4
2.	0.189	3	7.	429.3	___	12.	2873.0	5	17.	99.9	___
3.	0.0023	___	8.	144	3	13.	2500	___	18.	2500.0	5
4.	1.04	3	9.	35.08	___	14.	8365.6	5	19.	48.57193	___
5.	7.500	___	10.	7,500	2	15.	0.920	___	20.	0.002300	4

Using significant figures, calculate the following addition and subtraction problems.
1. 12 cm + 0.031 cm + 7.969 cm = _____

2. 0.085 cm + 0.062 cm + 0.14 cm = __0.29 cm__

3. 3.419 g + 3.912 g + 7.0518 g + 0.00013 g = _____

4. 8.7 g + 15.43 g + 19 g = __43 g__

5. 143.0 ml + 289.25 ml + 107.85 ml = _____

6. 41.025 cm – 23.28 cm = __17.75 cm__

7. 289 g – 43.7 g = _____

8. 145.63 ml – 28.9 ml = __116.7 ml__

9. 62.47 g – 39.9 g = _____

10. 40.08 ml – 29.0941 ml = __10.99 ml__

+/- use the number line

Hundreds Tens Ones Tenths hundredths

Positional

Using significant figures, calculate the following multiplication and division problems.
1. 2.89 cm x 4.01 cm = _____

2. 17.3 cm x 6.2 cm = __110 cm²__   [²]

3. 3.08 m x 1.2 m = _____

4. 5.00 mm x 7.3216 mm = __36.6 mm²__   [³]

5. 20.8 dm x 123.1 dm = _____

6. 8.071 cm² ÷ 4.216 cm = __1.914 cm__   [4]

7. 24,789.4 km² ÷ 43.5 km = _____

8. 109.3758 m² ÷ 5.813 m = __18.82 m__   [4]

9. 6.058 mm² ÷ 0.85 mm = _____

10. 4.23 m² ÷ 18.491 m = __0.229 m__   [³]

Convert the following standard notations to scientific notation.

1.	28,000,000	_____	6.	62,500	6.25×10^4
2.	305,000	3.05×10^5	7.	0.002403	_____
3.	0.000024863	_____	8.	8,809,000	8.809×10^6
4.	345.23	3.4523×10^2	9.	0.251	_____
5.	0.00025	2.5×10^{-4}	10.	3,010,000	3.01×10^6

Convert the following scientific notations to standard notation.

1. 8.54×10^{12} _____
2. 2.101×10^{-5} _0.00002101_
3. 3.051×10^{7} _____
4. 5.94×10^{-4} _0.000594_
5. 8.27×10^{3} _____

6. 3.86×10^{9} _3 86 0 0000 00_
7. 2.511×10^{-7} _____
8. 4.820×10^{6} _4 820 000_
9. 2.88×10^{5} _____
10. 4.05×10^{-2} _0.0405_

Calculate the following addition and subtraction problems. (Remember Sig. Figs.)

1. $(1.20 \times 10^{2}) + (3.600 \times 10^{3}) + (4.5000 \times 10^{4}) = $ _____

2. $(7 \times 10^{1}) + (6.5 \times 10^{-1}) + (4.9 \times 10^{-2}) = $ _____

3. $(5.3 \times 10^{19}) + (1.32 \times 10^{18}) = $ _____

4. $(1.2 \times 10^{1}) + (3.1 \times 10^{-2}) + (7.969 \times 10^{2}) = $ _____

5. $(8.5 \times 10^{3}) + (6.2 \times 10^{4}) + (3.412 \times 10^{2}) = $ _____

6. $(8.523 \times 10^{2}) - (6.27 \times 10^{1}) = $ _____

7. $(3.25 \times 10^{-2}) - (4.679 \times 10^{-3}) = $ _____

8. $(6.452 \times 10^{6}) - (5.352 \times 10^{5}) = $ _____

9. $(6.2 \times 10^{-2}) - (6.18 \times 10^{-3}) = $ _____

10. $(2.89 \times 10^{7}) - (4.37 \times 10^{2}) = $ _____

Calculate the following multiplication and division problems. (Remember Sig. Figs.)

1. $(6 \times 10^{5}) \times (4 \times 10^{-3}) = $ _____

2. $(3.2 \times 10^{3}) \times (3.332 \times 10^{-5}) = $ _____   5.432   6

3. $(5.432 \times 10^{4}) \times (3.67953 \times 10^{6}) = $ _____   5.432 E 6

4. $(9.8670 \times 10^{-3}) \times (2.1 \times 10^{-4}) = $ _____ 5.432×10^{6}

5. $(7.26 \times 10^{7}) \times (5.0030 \times 10^{5}) = $ _____

6. $(7.7 \times 10^{6}) \div (1.1 \times 10^{2}) = $ _____

7. $(8.53 \times 10^{5}) \div (5.0 \times 10^{3}) = $ _____

8. $(9.32 \times 10^{-3}) \div (3.1 \times 10^{-3}) = $ _____

*2sf→ 9. $\dfrac{(2.1 \times 10^{-2})(4.56 \times 10^{5})}{(6.4 \times 10^{-7})} = $ _1.5×10^{10}_

*2sf→ 10. $\dfrac{(8.4 \times 10^{-5})(1.4 \times 10^{3})}{(4.367 \times 10^{-2})} = $ _2.7×10^{0}_

9/25/15 <u>Communication Through Numbers</u>

Accuracy: ability to get close to the expected result.

Precision: ability to repeat results — consistancy

$$\% \text{ error} = \left| \frac{(\text{measured value} - \text{accepted value})}{\text{accepted value}} \right| \times 100 =$$

↖ (measures accuracy)

measuring precision = results w/ the smallest range.
　　　highest value — lowest value = range

Practice
④　$\% \text{ error} = \left| \frac{(m - A)}{A} \right| \times 100$　　　　$A = 47.00g$

A　$\% \text{ error} = \left| \frac{(47.01g - 47.00g)}{47.00g} \right| \times 100 = 0.02128 \% \text{ error} \longleftarrow \begin{array}{l} \text{most} \\ \text{accurate} \end{array}$

B　$\% \text{ error} = \left| \frac{(46.88g - 47.00g)}{47.00g} \right| \times 100 = 0.2553 \% \text{ error}$