

Notes: Day 1: Order of Operations

1) A few things we need to remember:

A. Order of Operations

\* Paranthesis – This means do anything contained within a grouping symbol (parenthesis, brackets, division bars, square roots, exponents, absolute value, etc). Follow the order of operations within the grouping symbol:

Grouping Symbols (these function just like Paranthesis)  $6 \cdot (3+2)$

-Absolute Value  $|-3+1|$

-Roots  $\sqrt{3+1}$   $\sqrt[3]{\quad}$

-Brackets  $[(3 \cdot 2) + 6]$

-Fractions (Numerator/Denominator)

$$\frac{(6 \cdot 2 + 1)}{(-4) - 2} = \frac{13}{-8}$$

\* Exponents – This means evaluate any exponents

$$2 + 3^2 \leftarrow$$

\* Multiply/Divide – This means do all multiplication and division (from left to right)

$$4 \div 2 + 1 \cdot 3$$

\* Add/Subtract – This means do all addition and subtraction (from left to right)

$$5 + 1 - 3$$

Evaluate each expression. Simplify co mpletely (You must show at least two steps on each problem. Problems with an expression with a fraction bar must show two steps each for the top and bottom). NO CALCULATORS!

2)  $4 + 4 - 3$   
 $8 - 3$   
 $5$

3)  $8 \div (3 + 1)$   
 $8 \div 4$   
 $2$

4)  $1 + 5^2$   
 $1 + 25$   
 $26$

5)  $2 + 6 \div 6$   
 $2 + 1$   
 $3$

6)  $(16 - 1) \div (4 + 1)$   
 $15 \div 5$   
 $3$

7)  $((1 + 1) \times 2) \div 4$   
 $(2 \cdot 2) \div 4$   
 $4 \div 4$   
 $1$

$$8) 5 + 6 - 1^2$$

$$\begin{array}{r} 5 + 6 - 1 \\ 11 - 1 \\ \hline 10 \end{array}$$

$$10) 3 + 3 + 6^2 + 1$$

$$\begin{array}{r} 3 + 3 + 36 + 1 \\ 6 + 36 + 1 \\ 18 + 1 \\ \hline 19 \end{array} \quad 43$$

$$12) 4 \times 6 - 8 \div 4 + 3$$

$$\begin{array}{r} 24 - 8 \div 4 + 3 \\ 24 - 2 + 3 \\ 22 + 3 \\ \hline 25 \end{array}$$

$$14) (-6) + 5 + 5 - 1 + 4$$

$$\begin{array}{r} -1 + 5 - 1 + 4 \\ 4 - 1 + 4 \\ 3 + 4 \\ \hline 7 \end{array}$$

$$16) (-4) \cdot 6 \cdot 2$$

$$\begin{array}{r} -4 \cdot 6 \cdot 2 \\ -24 \cdot 2 \\ \hline -48 \end{array}$$

$$18) 1 + 8 + |2 - 4| - 2$$

$$\begin{array}{r} 1 + 8 + |-2| - 2 \\ 1 + 8 + 2 - 2 \\ 9 + 2 - 2 \\ 11 - 2 \\ \hline 9 \end{array}$$

$$9) 15 \div (4 + 3 - 4)$$

$$\begin{array}{r} 15 \div (7 - 4) \\ 15 \div 3 \\ \hline 5 \end{array}$$

$$11) (16 - 3 - (7 - 6)) \div 4$$

$$\begin{array}{r} (16 - 3 - 1) \div 4 \\ (13 - 1) \div 4 \\ 12 \div 4 \\ \hline 3 \end{array}$$

$$13) 6(2^3 - 1) + 5$$

$$\begin{array}{r} 6(8 - 1) + 5 \\ 6(7) + 5 \\ 42 + 5 \\ \hline 47 \end{array}$$

$$15) (4 - 2)(5 + 6) + 6$$

$$\begin{array}{r} 2(5 + 6 + 6) \\ 2(11 + 6) \\ 2(17) \\ \hline 2 \cdot 17 = 34 \end{array}$$

$$17) (-2) \times \frac{-8}{(-4) \times (-1)}$$

$$\begin{array}{r} -2 \cdot \frac{-8}{4} \\ -2 \cdot -2 \\ \hline 4 \end{array}$$

$$19) -\frac{7}{7} - 2 + -10 + 8 + 6$$

$$\begin{array}{r} -1 - 2 + 8 + 6 \\ -3 - 10 + 8 + 6 \\ -13 + 8 + 6 \\ \hline -5 + 6 \\ \hline 1 \end{array}$$