Algebra I
Lesson 1.6 – Order of Operation
Mrs. Snow, Instructor

Simplify $-4^2 + 36 \div 2(4+5) \cdot 5$  What do we do first!?!?!

This is where more rules help. By establishing and following an **order of operation** mathematicians guarantee a repeatable and accurate answer. So the order of operations is: parentheses, exponent, multiplication, division, addition, and subtraction. Now that is a tedious list to have to memorize; what may be easier is to learn this mnemonic and remember what the initials stand for:

Please	**E**xcuse	**M**y	**D**ear	**A**unt	**S**ally
Parentheses	**E**xponent	**M**ultiplication	**D**ivision	**A**ddition	**S**ubtraction

Using the order of operations, our expression simplifies as such:

$-4^2 + 36 \div 2(4+5) \cdot 5 =$ $-4^2 + 36 \div 2(9) \cdot 5 =$ $-(4^2) + 36 \div 2(9) \cdot 5 =$ $-16 + 36 \div 2 \times 9 \cdot 5 =$ $-16 + 18 \times 9 \cdot 5 =$ $-16 + 162 \cdot 5 =$ $-16 + 810 =$ $= 794$	1. parentheses 2. exponent; watch out for the negative!!! 3. division and multiplication; reading left to right, do whichever comes first 4. keep working through left to right and finish all division and multiplication 5. addition and subtraction; reading left to right, do whichever comes first

Simplify:

$8 \div \frac{1}{2} \cdot 3$

$5.4 - 3^2 + 6.2$

$-20 \div [-2(4+1)]$
Brackets are done before parentheses!

$14 + x^2 \div 4 \ \ for\ x = 2$

$(x \cdot 2^2) \div (2+6)\ for\ x = 6$

$3 - x + 2 \div 4 \cdot 4 \ \ for\ x = 0$

Fraction bars, radical symbols, and absolute value symbols are also grouping symbols. A fraction bar means division.  Here you must put the numerator in parentheses and the denominator in parentheses.

$\frac{5 + 2(-8)}{(-2)^3 - 3}$

$|4 - 7|^2 \div (-3)$

$\sqrt{50 - 1}$

Words to math: we will often have sentences that we will need to translate into a math expression.

One fourth the difference of 7 and 2

The square root or the product of 8 and y

The product of 6.2 and the sum of 9.4 and 8