# AMA SUMMER ASSIGNMENT

**Advanced Math Applications is a math elective course that focuses on business, economics, personal finance, taxes, and the stock market. You will be working with many equations with many variables in the context of "real life." To this point, you will need to make sure that all of your math skills are sharp when you walk back into school in September. The topics we cover will be new topics, but they will use every piece of math you have learned up to this point. Below are topics that will be used throughout the year, so please read about them and complete the related problems. We will be building on everything you have learned up to this point.**

***All work is due the first day of school! Good luck! Please complete all work on a separate piece of paper!***

## LINES

Lines are linear equations. Any two unique points make a line. If you are given any two points, you can always find the equation between them by finding the slope and then y-intercept. When comparing two lines, they can be: parallel, perpendicular, or intersect in a manner other than perpendicular. The slopes of parallel lines are the same, whereas perpendicular lines have negative reciprocal slopes. To find the point of intersection of two lines you may use substitution or elimination.

**EXERCISES:**

1) Find the equation of the line between (-1,5) and (7,4).
    a. Slope?
    b. Y-intercept?
    c. Equation?
2) Find the equation of the line between (4,5) and (8,12).
3) Are the two lines parallel, perpendicular, or neither? Why? $y = -2x-6$ and $y = 2x+7$
4) Find the equation of the line parallel to $y - 2 = 3x$ with a y-intercept of (0,-1).
5) Find the equation of the line perpendicular to $2y - 2 = x$ with a y-intercept of (0,5).
6) I want to shift the line $y = -2x + 6$ to the right, only moving the y-intercept and not changing the slope. Give an equation to model this.
7) Find the intersection of the two lines: $y - 3 = 6x$ and $y = x - 3$.
8) Find the intersection of the two lines: $2y - 4 = x$ and $4y - 3 = 2x$.

**ORDER OF OPERATIONS:**

This may seem like a topic from Algebra 1, but you will use it again and again in AMA. We will be exploring exponential equations with very complicated formulas, so knowing what operation to perform first will be vital.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

← This is an example of a problem we will be solving. It will seem "scary" now, but if you follow the order of operations, you will have no problems! --- Sometimes it's actually easier to do the order of operations yourself instead of plugging in the whole thing into a calculator because you must watch your parentheses!

Always remember PEMDAS!!!

**EXERCISES:**

**Simplify:**

9) (1-(3+8)-2+6/2+1)
10) $(2 - 2^3 + 3^{-1} – 2)$
11) $(4 – 4/2) + 9^{1/2} + 3 – (9*2) – 5$
12) $4((2-1)-3)^2 + 5$

## EXPONENTS:

Once again, these are an Algebra 2 topic, but when we deal with "earning money," you will see lots of exponents. Remember that an exponent of 2 does not mean multiplying by 2, but instead "squaring." Squaring means to multiply a quantity by itself. A fractional exponent is the same thing as a "root." For example: $9^{1/2} = \sqrt{(9)} = 3$. Another example: $27^{1/3} = \sqrt[3]{(27)} = 3$ (because $3^3 = 27$). A negative exponent is the same as the reciprocal with the positive exponent. For example: $x^{-7} = 1/x^7$.

**EXCERCISES:**

13) Simplify:
    a. $2^{-3} =$
    b. $2^2 * 3^{-1} =$
    c. $1^{-3} + 2^{-3}*4 + 9(1/3)^{-1}$
14) Solve for x:
    a. $x^2 = 36$
    b. $x^3 = 8$
    c. $x^{1/2} = 4$
    d. $x^{1/3} = 3$
    e. $x^{2/3} = 16$