Dear Pre-Calculus Students,

Welcome to Pre-Calculus (2015-2016). As the name implies, this course is offered to prepare you to take "higher level" mathematics with the emphasis on preparation for the next level – CALCULUS! A graphing calculator is required for this course, a TI – 83 or a TI – 84. If you need validation for a slightly different version or model of calculator, you may email me for approval.

Attached is an assignment that you will need to have done on the **first day of school next year**. It will be collected to be **checked** and **graded**. The following day will serve as a quick review session of all the material (in which the assignment will be returned), and then a test will be administered the next day (third day of school). As you look at the material you should see that it is all review material and future class time will not be used to go over it – i.e. this is material that you should know. I suggest that you do the assignment as soon as possible (**showing all of your work and answers on a separate sheet of paper.**) and then enjoy the summer. Before school starts next year, take out the assignment, make sure it is complete and review it. I will give the answers on the second day of school after it is graded.

If you need help, please refer to the suggested link (VarsityTutors.com) listed under the "Student Resource" tab on the high school website. If that doesn't help, you may refer to my Review Packet that I have attached as well. Good luck!

Enjoy your summer!
Mr. Davis

Pre-Calculus Summer Homework Assignment

The following assignment is due on the first day of school next year. There will be a test over this material on the third day of school. No calculators should be used on this assignment.

1. Classifying Numbers
   a. Identify which numbers are natural (counting) numbers, integers, rational numbers, irrational numbers, and real numbers.
   $$\left\{-3,\ 4/3,\ 0.12,\ \sqrt{2},\ \pi,\ 2.\overline{15},\ 10\right\}$$

2. Integer Exponents
   Simplify each expression so that all exponents are positive.
   a. $\dfrac{x^{-2}y^{-3}}{x}$

   b. $\left(\dfrac{4y}{5x}\right)^{-2}$

   c. $\dfrac{(3xy^{-1})^{-2}}{(2x^{-1}y)^{3}}$

3. Polynomials
   Perform the indicated operation
   a. $(3x^3 + 7x^2 - x + 4) - (5x^2 + 3x - 5)$

   b. $(3x + 2)(5x - 7)$

   c. $(x + 1)(x^2 + 2x - 4)$

   d. $(4x - 5)^2$

4. Factor Polynomials
   Factor each completely
   a. $4x^2 - 12$

   b. $x^2 - 9$ *difference of two squares!*

   c. $x^2 - 6x + 8$

   d. $2x^2 - x - 6$

5. Solve equations

Solve each linear equations

a. $4x + 7 = 13x - 5$

b. $2x - 3(x - 4) = 5$

Solve equations with fractions

c. $\frac{2x}{3} + \frac{3}{4} = \frac{5x}{6}$

d. $\frac{2}{x-3} + \frac{2}{x-2} = \frac{10}{x^2-5x+6}$

Solve quadratic equations

e. $x^2 - x - 6 = 0$ *solve by factoring!*

f. $2x^2 + 3x - 1 = 0$ *solve by using quadratic formula!*

g. $x^2 + 6x = 5$ *solve by completing the square!*

Solve polynomial equations

h. $4x^3 - 12x^2 + 8x = 0$

i. $x^4 - 3x^2 + 2 = 0$

Solve equations involving a radical

j. $\sqrt{x + 10} = x - 2$

Solve equations with rational exponents

k. $(x + 1)^{2/3} = 4$

l. $(x^2 - x - 22)^{4/3} = 16$

Solve equations with absolute values

m. $|3x + 2| = 7$

Solve linear inequalities

n. $5x - 7 > 3x + 9$

Solve double inequalities

o. $-3 \leq 6x - 1 < 3$

6. Rational Expressions

       Simplify each rational expression to lowest terms

       a. $\frac{24x^2}{12x^2-6x}$
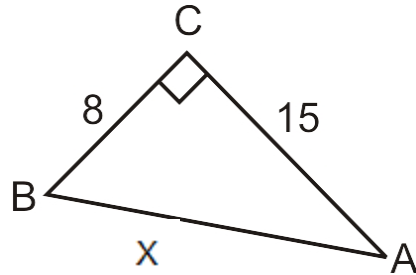
       b. $\frac{x^2+4x+4}{x^2-16}$

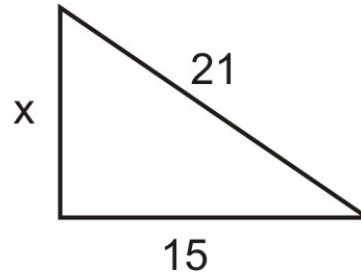7. Geometry Review

       Pythagorean Theorem: Find the missing lengths.

       a.   b.
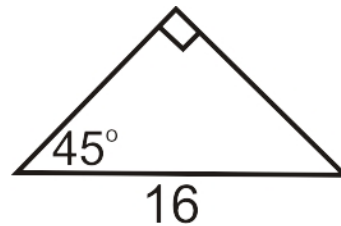

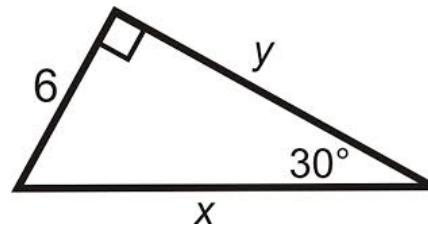   Special Right Triangles: find the missing lengths.

       a.   b.

8. Equations of Lines

       Write the equation of the line that satisfies each of the following conditions.

       a. Passes through the points $(2,5)$ and $(0,1)$.

       b. Slope of $-3/2$ and passes through the point $(2,-4)$.

9. System of Equations

       Solve the system of equations. (Use substitution!)

       a. $3x+2y=-12$ and $5x+y=-20$

10. Finding x and y intercepts

       Find the x and y intercepts for each function.

       a. $2x+3y=5$

       b. $y=x^2+x-2$