9th Grade Assignment – Week #28

Important Note: For next Monday's lecture (week #29), you will need to refer to your Bases Tables that we did in Week #7 – Problem Set #8 from the *Exponents & Polynomials* unit (also p25-26 in the workbook). These base tables are also included at the start of the *Logarithms* unit.

Group Assignment:

For Tuesday

1) Solve $15x^2 - 14x - 8 = 0$ using the quadratic formula.

- Work together on the word problems from **Problem Set #13** (*Quadratic Formula* unit): problems #10-13. (Get as far as you can!)

For Thursday

2) *Puzzle!*

A man hires three men to paint his house. The first painter boasts that he can paint the house himself in just 6 hours, the second says he can do it in 4 hours, and the third can do it in 3 hours. How long would it take all three painters to do the job if they all worked together?

3) *Puzzle!*

One-fifth of Cathy's herd of cows is in the barn. One-third is in the pasture. A number of cows equal to twice the difference of the first two groups is drinking in the stream. The remaining 18 cows are wandering in the forest. How many cows are there in the whole herd?

Still needing more challenge? Work on the word problems from **Problem Set #12.**

Individual Work

- Do **Problem Set #11** (*Quadratic Formula* unit): problems #1-11.

- If you wish (and you didn't do so last week), write a "summary" or "main lesson book" page on the *Quadratic Formula*.

- If you have the time and desire, finish any of the above Group Assignment.

Problem Set #11

Homework

1) Give the Quadratic Formula.
2) The Quadratic Formula is the solution to what equation?
3) Give the proof of the quadratic formula.

Solve the equation using each of the three methods (as stated on the previous set):

4) $x^2 - 7x + 12 = 0$

Solve by using the easiest method:

5) $x^2 + 8x + 5 = 0$
6) $x^2 + 2x - 35 = 0$
7) $x^2 + 2x + 3 = 0$
8) $4x^2 + x - 3 = 0$
9) $3x^2 + 5x + 2 = 0$
10) $7x^2 + 8x - 3 = 0$

Word Problems

The following three problems are the same as the first three problems in set#3, except that the numbers have been changed.

11) A rectangle has a length of 10 inches and a height equal to the length of the side of a square. Find the side of the square such that the square has an area that is 56 square inches greater than the rectangle.

12) A rectangle has a length of 8 inches and a height equal to the length of the side of a square. Find the side of the square such that the rectangle has an area that is 15 square inches greater than the square.

13) A rectangle has a length of 7 inches and a height equal to the length of the side of a square. Find the side of the square such that the sum of the areas of the two figures is 50 square inches.

14) What are the dimensions of a rectangular garden that has a perimeter of 66 ft and an area of 216 ft^2?

15) Wendy has nickels, dimes and quarters, 18 coins in all, worth a total of two dollars. How many of each coin are there if there are twice as many dimes as nickels?

Problem Set #12

Homework

1) Give the Quadratic Formula.
2) The Quadratic Formula is the solution to what equation?

Solve.

3) $x^2 + 6x + 2 = 0$
4) $3x^2 + 5x - 3 = 0$
5) $2x^2 + 3x - 5 = 0$
6) $2x^2 + 3x = 3(x+7)$
7) $\frac{4x}{x-2} = \frac{x-5}{x-3}$
8) $\frac{2}{x-1} = \frac{3}{x-3} + \frac{2}{x-4}$
9) $(x+4)(x-5) = 2x^2 - 4x - 48$
10) $(2x+3)(2x-3) = -x-6$
11) $(x-3)^2 = 3x^2 + 4x + 12$

Find the common solution.

12) $x + 4y = 3$
$y^2 - 2x = 10$

13) What can be said about the relationship of a, b, c in the case that a quadratic equation has no solution?

Word Problems

14) A rectangle has a length of 10 inches and a height equal to the length of the side of a square. Find the side of the square such that the sum of the areas of the two figures is 20 square inches.

15) The sum of two numbers is 15. The square of one of them plus twice the other is 54. What are the two numbers?

16) A rectangular garden plot runs along the side of a building and is surrounded on the other three sides by a fence. Find the dimensions of the plot if the total length of the fence is 17m and the area of the plot is $35m^2$.

17) A 10m tall wooden pole snaps just below its middle. Remaining connected, the top portion falls over, and touches the ground 3m from the base. How far from the base did the break occur?

Problem Set #13

Homework

Solve.

1) $x^2 = x + 1$
2) $(x + 5)^2 = 3x^2 - 23$
3) $(x + 6)(x - 4) = x^2$
4) $(x + 6)(x - 4) = 2x^2$
5) $10x^2 + 40x + 20 = 0$
6) $5 - 2(3x - 4) = 3x^2 - 6x$
7) $\frac{3}{x-3} - \frac{3x-1}{x} = \frac{9}{x^2-3x}$
8) $2x^2(x-5) + 16 = (3x-4)^2$

Find the common solution.

9) $2x + y = 7$
$x^2 + 3y = 13$

Word Problems

10) One number is three less than twice another number. The sum of their squares is 94¼. Find the two numbers.

11) Karen is ⅔ as old as Bill. Three years ago, the product of their ages was 273. How old is Karen now?

12) A rectangular piece of cardboard is twice as long as it is wide. If squares measuring 3 inches on a side are cut off each of the corners of the cardboard, then the four sides can be folded up to form a open-topped box that has a volume of 300 cubic inches. How long is the longest edge of the box?

13) (From Euclid's *The Elements,* Book II, Th. 11)

a) Where can you cut a 10cm-long straight line such that the rectangle formed by the whole line and one of the segments is equal to the square on the remaining segment?

b) What is the ratio (in decimal form) of the lengths of the two segments found above?