

## 9<sup>th</sup> Grade Assignment – Week #27

### Group Assignment:

*For Tuesday*

- Work together on **Problem Set #8** (*Quadratic Formula* unit): problems #1, 4, 5, 9, 10. (Get as far as you can.)

*For Thursday* The moment we've been waiting for – the derivation of the Quadratic Formula!!

- Warm up by doing **Problem Set #9**: problem #1.
- Derive the Quadratic Formula by doing **Problem Set #9**: problem #2

*For Tuesday or Thursday – if you have extra time and need a challenge!*

- Do **Problem Set #8**: problem #3.

### Individual Work

- Finish any of the unfinished problems from Tuesday's group work (above).
  - Do **Problem Set #8**: problems #6-8.
  - Do **Problem Set #9**: problems #3-6
- 1) Solve this problem using the method of completing the square:
- $$9x^2 + 21x + 5 = 0$$
- (Optional) Do **Problem Set #9**: problems #7-9
  - If you wish, write a "summary" or "main lesson book" page on the *Quadratic Formula*.

## Problem Set #8

**Note:** From this point forward, all answers involving irrational numbers should be given both as an exact (perhaps irrational) number, and as a decimal approximation.

### Group Work

- 1) Solve problem#3 from Set#3 using...
  - a) Al-Khwarizmi's geometrical method.
  - b) Al-Khwarizmi's formula.
  - c) The method of completing the square.
- 2) Consider problem#2 from Set#3. Solve it using the easiest of the above three methods.
- 3) *Challenge!* Consider problem #1 from Set#3.
  - a) How would al-Khwarizmi have stated this problem?
  - b) Show how he might have solved it geometrically.

- c) Give a formula that he might have given for solving this problem.

**Solve** by completing the square.

4)  $4x^2 - 21x + 5 = 0$

- 5)  $x^2 + bx + c = 0$  (Your answer to this should be the same as from a problem on an earlier set. Which one is it?)

### Homework

**Solve** by completing the square.

6)  $x^2 - 4x - 60 = 0$

7)  $x^2 + 3x - 5 = 0$

8)  $x^2 + 3x + 5 = 0$

9)  $5x^2 + 13x - 6 = 0$

10)  $3x^2 + 13x + 5 = 0$

## Problem Set #9

### Group Work

**Solve** by Completing the Square.

- 1)  $3x^2 + 11x + 5 = 0$   
(Leave your answer in square root form.)
- 2)  $ax^2 + bx + c = 0$   
(Your answer is the Quadratic Formula!)

### Homework

**Solve** by completing the square.

3)  $x^2 + x - 5 = 0$

4)  $6x^2 - 19x + 10 = 0$

5)  $3x^2 + 4x + 5 = 0$

6)  $3x^2 + 4x - 5 = 0$

### Word Problems

- 7) The length of a rectangle is 3m more than the width. What are the dimensions if the perimeter is 15m?
- 8) Find the width of a rectangle if twice the width is six feet more than the length, and the area is 80 ft<sup>2</sup>.
- 9) A rectangle has a length of 18 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 80 square inches greater than the square.