Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

WARM-UP: Perfect Square Trinomials

Factor the following trinomials:

- $x^2 + 8x + 16 =$ _____
- $x^2 + 2x + 1 =$ _____
- $x^2 - 18x + 81 =$ _____
- $x^2 - 10x + 25 =$ _____

These are called **perfect square trinomials**. If you have a perfect square trinomial, you can solve the quadratic equation by square roots!

EXAMPLES

Directions: Factor the perfect square trinomial, then solve the equation by square roots. Remember a positive number always has two square roots, so you must solve for both cases.

1. $x^2 + 4x + 4 = 25$

2. $x^2 - 12x + 36 = 81$

3. $x^2 - 14x + 49 = 4$

4. $x^2 + 6x + 9 = 1$

COMPLETING THE SQUARE (when a = 1)

When you do not have a perfect square trinomial, you can create one. This process is called **completing the square**. Follow the steps below to solve the equation by completing the square.

	Steps	Example
1	Rewrite as $x^2 + bx = c$	$x^2 + 8x + 7 = 0$
2	Take half of b, square it, then add this to both sides.	
3	Factor the perfect square trinomial.	
4	Take the square root of both sides and solve for both cases.	

YOU TRY!

Directions: Solve each equation by completing the square.

5. $x^2 - 12x + 27 = 0$

6. $x^2 + 4x - 5 = 0$

7. $x^2 + 71 = 18x - 9$

8. $x^2 + 2x - 50 = -2$

IRRATIONAL SOLUTIONS

Directions: Solve each equation by completing the square. Simplify all irrational solutions.

9. $x^2 - 2x - 4 = 0$

10. $x^2 + 16x + 46 = 0$

11. $x^2 + 7x + 7 = 66 - x$

12. $x^2 - 2 = 6x - 3$