

10.22.15  
Quadratic Equations  
Lesson 16  
Section 4.1,4.2

Warm-up

Complete the Square to make a perfect trinomial

1)  $x^2 + 4x + \underline{\hspace{2cm}}$

2)  $x^2 + 18x + \underline{\hspace{2cm}}$

Factor

3)  $x^2 - 8x + 16$

4)  $x^2 + 15x + 25$

Simplify

5)  $\sqrt{-36} =$

6)  $\sqrt{-20} =$

Solve using the quadratic formula

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

Finding roots

Left column explain what they think about the following question.

The right column listen.

**What is a root of a polynomial function?**

Right Column explain

Left column listen.

**What is one way we can find the REAL roots of a function?**

**IE:  $y = x^2 + 5$**

**Note\* For every degree there is a complex root.**

**Note\* All Real roots ARE complex roots.**

I Try:

State the number of complex roots in the equation, then find the real root.

$$x^4 + x^2 - 2 = 0$$

Degree= # of complex roots	Degree: # of Complex Roots:
Factor	
Solve for x to find roots	

We Try:

State the number of complex roots in the equation, then find the real root.

$$t^3 + 2t - 4t - 8 = 0$$

Degree= # of complex roots	Degree: # of Complex Roots:
Factor	
Solve for x to find roots	

You Try with your partner on the whiteboards:

Left talk, Right write

$$t^2 + 4 = 0$$

Degree= # of complex roots	Degree: # of Complex Roots:
Factor	
Solve for x to find roots	

You Try with your partner on the whiteboards:

Right talk, left write

$$4x^3 - 2x^2 - 30x = 0$$

Degree= # of complex roots	Degree: # of Complex Roots:
Factor	
Solve for x to find roots	

**Take your notebooks and pair up with your 6 o clock partner.**

- 1) How many degrees are there in a quadratic equation?
- 2) How many Roots are there in a quadratic equation?

There are at least 4 ways of finding roots for a Quadratic Equation.

- 3) Form a list of a couple different ways with your partner.

$$x^2 - 4x + 5 = 0$$
$$4x^2 - 2x + 9 = 0$$
$$x^2 + 4x + 5 = 0$$

Standard form:  $ax^2 + bx + c = 0$

### Completing the Square

I Try:

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

Separate the variables and constants	
Complete the perfect trinomial by adding onto both sides. $ax^2 + bx + c$ $c = \left(\frac{b}{2}\right)^2$	
Write the trinomial as factors.	
Solve for x	

I Try:  
 $p^2 - 3p - 88 = 0$

Separate the variables and constants	
Complete the perfect trinomial by adding onto both sides. $ax^2 + bx + c$ $c = \left(\frac{b}{2}\right)^2$	
Write the trinomial as factors.	
Solve for x	

We Try:  
 $x^2 - 10x + 21 = 0$

Separate the variables and constants	
Complete the perfect trinomial by adding onto both sides. $ax^2 + bx + c$ $c = \left(\frac{b}{2}\right)^2$	
Write the trinomial as factors.	
Solve for x	

You Try on whiteboards.

Left talk, Right write:

$$x^2 - 6x - 16 = 0$$

Separate the variables and constants	
Complete the perfect trinomial by adding onto both sides. $ax^2 + bx + c$ $c = \left(\frac{b}{2}\right)^2$	
Write the trinomial as factors.	
Solve for x	

$$ax^2 + bx + c = 0$$

What happens when  $a \neq 1$ ?

I Try:

$$3x^2 + 7x + 7 = 0$$

Separate the variables and constants	
Divide both sides by $a$	
Complete the perfect trinomial by adding onto both sides. $ax^2 + bx + c$ $c = \left(\frac{b}{2}\right)^2$	
Write the trinomial as factors.	
Solve for x	

We Try:

$$7x^2 - 14x - 56 = 0$$

Separate the variables and constants	
Divide both sides by $a$	
Complete the perfect trinomial by adding onto both sides. $ax^2 + bx + c$ $c = \left(\frac{b}{2}\right)^2$	
Write the trinomial as factors.	
Solve for x	

You Try:  
 $4v^2 + 16v = 65$

Separate the variables and constants	
Divide both sides by $a$	
Complete the perfect trinomial by adding onto both sides. $ax^2 + bx + c$ $c = \left(\frac{b}{2}\right)^2$	
Write the trinomial as factors.	
Solve for x	



Exit Slip

Put your name on one side, solve the problems on the other side.

Solve by completing the Square

$$1) p^2 + 2p + 8 = 0$$

State the number of complex roots in the equation, then find the real root.

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