Simplify each.

1. $(4+\sqrt{-49})-(5-\sqrt{-9})$

$4+7i \quad -5+3i \quad -1+10i$

2. $(-2+i)(5-3i)$

$-10+5i+6-3i^2 = -7+11i$

$-3(-1)$

$+3$

3. $(2i)(5i)(3-4i)$

$10i^2 = -10$

$-30+40i$

Simplify: i^{831} $\quad -i$

$i = \sqrt{-1} = i$

$i^2 = -1$

$i^3 = -i$

$i^4 = 1$

$207 \quad r=3$

$4\overline{)831}$

8

28

Two complex numbers are equal if their real parts are equal and their imaginary parts are equal.

The two imaginary numbers below are equal. Find the value of x and y.

$2x + 3yi \quad \& \quad -14 + 15i$

$2x = -14$

$x = -7$

$y = 5 \qquad 3y = 15$

Simplify each.

4. $(7-2i)^2$

$= 45 - 28i$

5. $(6+4i)(6-4i)$

$36 - 16i^2$

$36 - 16(-1)$

$36 + 16 = 52$

a + bi and a - bi are called complex conjugates.

Two binomials that are identical except they have opposite signs in the middle.

x + 7 and x - 7 are conjugates. What is the result every time conjugates are multiplied?

(x + 7)(x - 7) = $x^2 - 49$

In general: (a + b)(a - b)= $a^2 - b^2$

What is the result every time complex conjugates are multiplied?

(a + bi)(a - bi) = $a^2 + b^2$

$(5+3i)(5-3i) = 34$

$(3i+1)(3i-1) = 10$

$(7i+2)(7i-2) = 53$

Find the product of each pair of conjugates.

1. (7 + 6i)(7 - 6i)

2. (3 - i)(3 + i)

Find all complex solutions:

$2m^2 + 71 = 7$

1. Find the equation of a quadratic, in Standard Form, with the following x-intercepts:

4 and -3

2. Find the equation of a quadratic, in Standard Form, with the following x-intercepts:

$\frac{5}{2}$ and $\frac{-1}{4}$

Given this equation: $x^2 + x + 2 = 0$

Can you solve this equation by taking square roots? NO

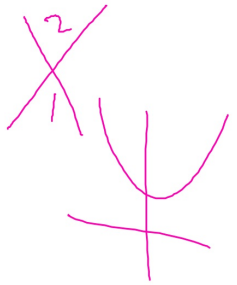
b doesn't equal zero

Can you solve this equation by factoring?

No factors of 2 add to 1 NO

Can you solve this equation by graphing?

Doesn't cross the x-axis NO



Sec 5-8: The Quadratic Formula

Equation must be written in the following form:

$ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

The results of using the Quadratic Fomula represent:

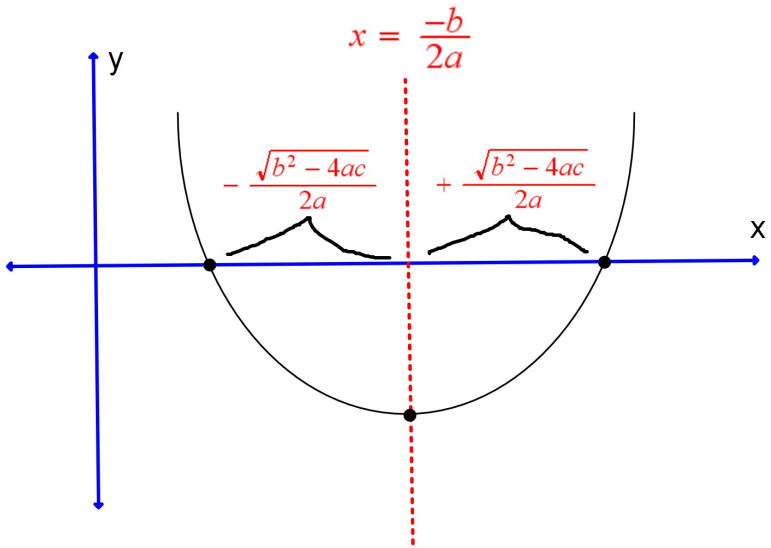
- solutions to the equation
- zeros of the function
- x-intercepts of the graph

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$ Can be written as:

$$x = \frac{-b}{2a} \pm \frac{\sqrt{b^2 - 4ac}}{2a}$$

LOS

Distance from LOS to both x-intercepts.



Solving Quadratic Equations:

1. Factoring. Works only if quadratic is factorable.
2. Square Roots. Works only if b=0
3. Graphing. Works only if solutions are real #'s
4. Quadratic Formula. **ALWAYS WORKS!**

Solve using the Quadratic Formula. Round to the nearest hundredth when necessary.

1. $2x^2 + 7x - 3 = 0$ x= 0.39, -3.89

$b^2-4ac = 73$

2. $3x^2 - 59x = 84$

$3x^2-59x-84=0$ $b^2-4ac = 4489$

$x=21, -1.33$

3. $x^2 + 2x + 5 = 0$