Warm-up

Solve by completing the square
1) $x^2 + 18x = 7$

2) Simplify $\left(\dfrac{a^3}{b}\right)^{-1}$

Sep 27-7:10 AM

Methods to Solve Quadratic Equations

Always works! { 1) Completing the Square

2) Quadratic Formula

3) Factoring

4) Finding zeros   Today ✓

5 Taking square roots of each side

Sep 18-8:35 PM

Method 1:
By Completing the Square   (Always works, but can be messy if we "half-it, square-it" and have fractions to work with.)

Sep 18-8:51 PM

Method 2:
By Quadratic formula   (Always works)

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

Sep 18-8:51 PM

Method 3:   Solve by Factoring

Works as long as the quadratic expression is *factorable*

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

X X, X X → X X X (3 terms)

grouping   sum & product

$ax^2 + bx + c$

$a = \dots, b = \dots, c \dots$

$\dfrac{a*c}{-,-} \Big| b(add)$

Sep 26-3:32 PM

Method 4:
Solve quadratics by taking square roots

Form: $ax^2 + c = 0$ (usually *missing the bx* term)

1) $x^2 - 49 = 0$

$$x^2 = 49$$
$$\sqrt{x^2} = \sqrt{49}$$
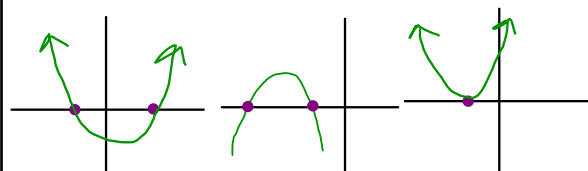$$x = \pm 7 \Rightarrow x = 7, \ x = -7$$

Mar 10-4:02 PM

Panel 1 (Mar 10-4:02 PM)

2) $2x^2 + 100 = 0$ $\sqrt{x^2} = \sqrt{-50}$

$2x^2 = -100$

$x^2 = -50$ $x = \sqrt{-1(2)(25)}$

3) $(x - 5)^2 = 81$ $x = \pm 5i\sqrt{2}$

$\sqrt{(x-5)^2} = \sqrt{81}$

$x - 5 = \pm 9$

$x - 5 = 9$ | $x - 5 = -9$

$\boxed{x = 14}$

Panel 2 (Mar 10-4:06 PM)

Method 5: Solve quadratics by graphing and find the 'zeros'

*Works when there are x-intercepts. May only get a decimal estimations of the actual solutions

Panel 3 (Mar 10-4:10 PM)

Use your calculator to find the **roots.**

1) $X^2 - 5X + 2 = 0$ [Slide to reveal]

2) $-3X^2 - 5X + 12 = -8$ [Slide to reveal]

3) $X^2 = -2X + 7$ [Slide to reveal]

4) $x^2 + 3 = 0$ [Slide to reveal]

Panel 4 (Sep 27-1:58 PM)

Practice

...then short quiz

Panel 5 (Mar 10-9:56 AM)

Operations on Imaginary Numbers

$a + bi$

Real Part   Imaginary Part

$3 + 2i$ | $i = \sqrt{-1}$

$i^2 = (\sqrt{-1})^2 = -1$

Add

$(3 + 6i) + (5 - 3i)$

$= 8 - 3i$

Panel 6 (Mar 10-10:01 AM)

Multiplication

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

$= 15 - 12i + 10i - 8i^2$

$= 15 - 12i + 10i - 8(-1)$

$= 15 - 2i + 8$

$= 23 - 2i$

Solve by Completing the Square.

1. $K^2 - 8K = -14$ $\square = \left(\frac{b}{2}\right)^2$

$K^2 - 8K + 16 = -14 + 16$ $b = -8$

$(K-4)^2 = 2$ $\square = \left(\frac{-8}{2}\right)^2$

$\sqrt{(K-4)^2} = \sqrt{2}$ $= (-4)^2$

$K-4 = \pm 1.4$ $= 16$

$K = 4 + 1.4 = \boxed{5.4}$

$K = 4 - 1.4 = \boxed{2.6}$

Mar 10-10:21 AM