Solving Quadratics Assignment - Answer Key

Monday, April 6, 2020 9:55 PM

4.13.2020 - Solving Quadratics Assignment

Name:

Algebra 2/Trig Distance Learning Assignment 1

Solve the following quadratic equations using the method specified. Show <u>all work</u> to receive credit.

A. Solve by **Factoring**

1. $y = x^2 - 9x + 20$

$0 = (x-5)(x-4)$

$x-5=0$ $\quad x-4=0$

$\boxed{x=5}$ $\quad \boxed{x=4}$

2. $5x^2 - x = 6$

$5x^2 - x - 6 = 0$

$(5x-6)(x+1) = 0$

$5x-6=0$ $\quad x+1=0$

$5x = 6$ $\quad \boxed{x=-1}$

$\boxed{x = 6/5}$

3. $3x^2 + 4x + 1 = 0$

$(3x+1)(x+1) = 0$

$3x+1=0$ $\quad x+1=0$

$3x = -1$ $\quad \boxed{x=-1}$

$\boxed{x = -\frac{1}{3}}$

B. Solve by **Square Rooting Both Sides**

4. $(x+3)^2 = 5$

$\sqrt{(x+3)^2} = \sqrt{5}$

$x+3 = \pm\sqrt{5}$

$-3 \quad -3$

$\boxed{x = -3 \pm \sqrt{5}}$

5. $y = (x-2)^2 + 1$

$0 = (x-2)^2 + 1$

$-1 \quad -1$

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

$\pm\sqrt{-1} = x-2$

$+2 \quad +2$

$2 \pm \sqrt{-1} = x$

$\boxed{2 \pm i = x}$

* Remember, $i = \sqrt{-1}$

C. Solve by **Completing the Square**

6. $y = x^2 + 8x + 4$

$0 = x^2 + 8x + 4$

$x^2 + 8x = -4$ $\quad \left(\frac{b}{2}\right)^2 = \left(\frac{8}{2}\right)^2 = 4^2 = 16$ (always positive!)

$x^2 + 8x + 16 = -4 + 16$

$(x+4)^2 = 12$

$\sqrt{(x+4)^2} = \sqrt{12}$

$x + 4 = \pm 2\sqrt{3}$

$-4 \quad -4$

$x = -4 \pm 2\sqrt{3}$

7. $y = x^2 - 10x - 1$

$0 = x^2 - 10x - 1$

$x^2 - 10x = 1$ $\quad \left(\frac{b}{2}\right)^2 = \left(\frac{-10}{2}\right)^2 = (-5)^2 = 25$ (always positive!)

$x^2 - 10x + 25 = 1 + 25$

$(x-5)^2 = 26$

$\sqrt{(x-5)^2} = \sqrt{26}$

$x - 5 = \pm\sqrt{26}$

$+5 \quad +5$

$x = 5 \pm \sqrt{26}$

8. $y = 3x^2 + 12x + 27$

Divide by "a" if $\neq 1$

$0 = \frac{3x^2}{3} + \frac{12x}{3} + \frac{27}{3}$

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

$x^2 + 4x = -9$ $\quad \left(\frac{b}{2}\right)^2 = \left(\frac{4}{2}\right)^2 = (2)^2 = 4$

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

$(x+2)^2 = -5$

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

$x + 2 = \pm i\sqrt{5}$ $\rightarrow$ $x = -2 \pm i\sqrt{5}$

$-2 \quad -2$

D. Solve by using the **Quadratic Formula**

9. $y = x^2 + 5x + 1$

$a = 1$
$b = 5$
$c = 1$

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

$x = \frac{-5 \pm \sqrt{(5)^2 - (4 \cdot 1 \cdot 1)}}{2 \cdot 1}$

$x = \frac{-5 \pm \sqrt{25 - 4}}{2}$

$x = \frac{-5 \pm \sqrt{21}}{2}$

10. $y = 2x^2 + 3x + 2$

$a = 2$
$b = 3$
$c = 2$

$x = \frac{-3 \pm \sqrt{(3)^2 - (4 \cdot 2 \cdot 2)}}{2 \cdot 2}$

$x = \frac{-3 \pm \sqrt{9 - 16}}{4}$

$x = \frac{-3 \pm \sqrt{-7}}{4}$

$x = \frac{-3 \pm i\sqrt{7}}{4}$