Name ANSWER KEY Per __

Quadratic Formula Review WS

Solve each quadratic equation using the quadratic formula: $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

1. $x^2 + 5x + 6 = 0$

$a=1 \quad b=5 \quad c=6$

$$x = \frac{-(5) \pm \sqrt{(5)^2-4(1)(6)}}{2(1)}$$

$$x = \frac{-5 \pm \sqrt{1}}{2} = \frac{-5 \pm 1}{2}$$

$x = -2 \quad x = -3$

2. $5x^2 - 4x = 33$

$a=5 \quad b=-4 \quad c=-33$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2-4(5)(-33}}{2(5)}$$

$$x = \frac{4 \pm \sqrt{676}}{10} = \frac{4 \pm 26}{10}$$

$x = 3 \quad x = -2.2 = \frac{-22}{10}$

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

$a=1 \quad b=3 \quad c=-1$

$$x = \frac{-(3) \pm \sqrt{(3)^2-4(1)(-1)}}{2(1)}$$

$x = \frac{-3 \pm \sqrt{13}}{2}$

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

$a=2 \quad b=-6 \quad c=0$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2-4(2)(0)}}{2(2)}$$

$$x = \frac{6 \pm \sqrt{36}}{4} = \frac{6 \pm 6}{4}$$

$x = 3 \quad x = 0$

5. $-2x^2 + 12x = 5$
$-5 \quad -5$

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

$a = -2 \quad b = 12 \quad c = -5$

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(-2)(-5)}}{2(-2)}$$

$$x = \frac{-12 \pm \sqrt{104}}{-4} \rightarrow \begin{aligned}\sqrt{104} &= \sqrt{4 \cdot 26} \\ &= \sqrt{4}\sqrt{26} \\ &= 2\sqrt{26}\end{aligned}$$

$$x = \frac{\overset{\div 2}{-12} \pm \overset{\div 2}{2}\sqrt{26}}{\underset{\div 2}{-4}}$$

$$\boxed{x = \frac{-6 \pm \sqrt{26}}{-2}}$$

6. $x^2 + 2x + 7 = 0$

$a = 1 \quad b = 2 \quad c = 7$

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(7)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-24}}{2} \rightarrow \begin{aligned}\sqrt{-24} &= \sqrt{-1 \cdot 4 \cdot 6} \\ &= \sqrt{-1}\sqrt{4}\sqrt{6} \\ &= 2i\sqrt{6}\end{aligned}$$

$$x = \frac{\overset{\div 2}{-2} \pm \overset{\div 2}{2i}\sqrt{6}}{\underset{\div 2}{2}}$$

$$\boxed{x = -1 \pm i\sqrt{6}}$$

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

$a = 1 \quad b = 3 \quad c = 5$

$$x = \frac{-(3) \pm \sqrt{(3)^2 - 4(1)(5)}}{2(1)}$$

$$x = \frac{-3 \pm \sqrt{-11}}{2}$$

$$\boxed{x = \frac{-3 \pm i\sqrt{11}}{2}}$$

8. $x^2 + 11 = 6x$
$-6x \quad -6x$

$x^2 - 6x + 11 = 0$

$a = 1 \quad b = -6 \quad c = 11$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(11)}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-8}}{2} \rightarrow \begin{aligned}\sqrt{-8} &= \sqrt{-1 \cdot 4 \cdot 2} \\ &= \sqrt{-1}\sqrt{4}\sqrt{2} \\ &= 2i\sqrt{2}\end{aligned}$$

$$x = \frac{\overset{\div 2}{6} \pm \overset{\div 2}{2i}\sqrt{2}}{\underset{\div 2}{2}}$$

$$\boxed{x = 3 \pm i\sqrt{2}}$$