

Reteaching 5-8

The Quadratic Formula

OBJECTIVE: Solving quadratic equations by using the Quadratic Formula

MATERIALS: None

Follow each step below to solve any quadratic equation by using the Quadratic Formula.

1. Write the equation in the standard form $ax^2 + bx + c = 0$.
2. Substitute a -, b -, and c -values into the Quadratic Formula.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
3. Simplify. Use imaginary numbers if necessary.
4. Check the solution(s) by substituting the values into the original equation.

Example

Use the Quadratic Formula to solve $x^2 + 2 = -2x$. Check your solution.

$x^2 + 2 = -2x$	
$x^2 + 2x + 2 = 0$	← Write in standard form.
$\underline{1}x^2 + \textcircled{2}x + \boxed{2} = 0$	← Underline a , circle b , and put a square around c .
$x = \frac{-2 \pm \sqrt{2^2 - 4(1)(2)}}{2(1)}$	← Substitute 1 for a , 2 for b , and 2 for c into the Quadratic Formula.
$= \frac{-2 \pm \sqrt{-4}}{2}$	← Simplify to find the values of x .
$= \frac{-2 \pm 2i}{2}$	
$= -1 \pm i$	

Check:

$x^2 + 2 = -2x$	$x^2 + 2 = -2x$
$(-1 + i)^2 + 2 \stackrel{?}{=} -2(-1 + i)$	$(-1 - i)^2 + 2 \stackrel{?}{=} -2(-1 - i)$
$1 - 2i + i^2 + 2 \stackrel{?}{=} 2 - 2i$	$1 + 2i + i^2 + 2 \stackrel{?}{=} 2 + 2i$
$1 - 2i - 1 + 2 \stackrel{?}{=} 2 - 2i$	$1 + 2i - 1 + 2 \stackrel{?}{=} 2 + 2i$
$2 - 2i = 2 - 2i\checkmark$	$2 + 2i = 2 + 2i\checkmark$

Exercises

Solve each equation using the Quadratic Formula.

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|----------------------------|--------------------|---------------------|
| 1. $x^2 - 3x + 2 = 0$ | 2. $-x^2 + 5x = 9$ | 3. $10x - 6 = 5x^2$ |
| 4. $x + 2x^2 + 1 = -1 - x$ | 5. $2x^2 + x = 10$ | 6. $2x + 1 = 2x^2$ |