

E-Learning Day Assignment - THE QUADRATIC FORMULA

Main Ideas/Questions	Notes/Examples								
<p>WARM UP</p>	<p>Directions: Identify a, b, and c.</p> <p>Standard Form of a Quadratic Equation: $ax^2 + bx + c$</p> <p>1. $3x^2 + 4x + 5 = 0$ $a = \underline{3}$, $b = \underline{4}$, $c = \underline{5}$</p> <p>2. $7x^2 + 2 = 0$ $a = \underline{7}$, $b = \underline{0}$, $c = \underline{2}$</p> <p>3. $6x^2 - 9x = 0$ $a = \underline{6}$, $b = \underline{-9}$, $c = \underline{0}$</p> <p>4. $x^2 + 5x = 3$ $a = \underline{1}$, $b = \underline{5}$, $c = \underline{-3}$</p> <p><i>Hint: rewrite in standard form!</i></p> <p>Answers: $x^2 + 5x - 3 = 0$</p> <p>1. $a = 3, b = 4, c = 5$ 2. $a = 7, b = 0, c = 2$</p> <p>3. $a = 6, b = -9, c = 0$ 4. $a = 1, b = 5, c = -3$</p>								
<p>THE QUADRATIC FORMULA</p>	<div style="text-align: center;"> <p>MEMORIZE! → $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$</p> </div> <p>A method for solving quadratic equations that are difficult to factor.</p> <p>Directions: Solve the equation using the quadratic formula.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Steps</th> <th style="width: 50%;">Example</th> </tr> </thead> <tbody> <tr> <td>1. Write the equation in standard form. Set it = 0.</td> <td>$x^2 - 5x = 36$ $x^2 - 5x - 36 = 0$</td> </tr> <tr> <td>2. Identify a, b, and c.</td> <td>$a = 1, b = -5, c = -36$</td> </tr> <tr> <td>3. Substitute these values into the formula. Find the solutions by solving for x.</td> <td> $x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(-36)}}{2(1)}$ $x = \frac{5 \pm \sqrt{25 + 144}}{2}$ $x = \frac{5 \pm \sqrt{169}}{2}$ $x = \frac{5 \pm 13}{2}$ <div style="text-align: center;"> </div> $x = \frac{5 + 13}{2} = \frac{18}{2} = 9$ $x = \frac{5 - 13}{2} = \frac{-8}{2} = -4$ </td> </tr> </tbody> </table> <p>2 solutions</p>	Steps	Example	1. Write the equation in standard form. Set it = 0.	$x^2 - 5x = 36$ $x^2 - 5x - 36 = 0$	2. Identify a , b , and c .	$a = 1, b = -5, c = -36$	3. Substitute these values into the formula. Find the solutions by solving for x .	$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(-36)}}{2(1)}$ $x = \frac{5 \pm \sqrt{25 + 144}}{2}$ $x = \frac{5 \pm \sqrt{169}}{2}$ $x = \frac{5 \pm 13}{2}$ <div style="text-align: center;"> </div> $x = \frac{5 + 13}{2} = \frac{18}{2} = 9$ $x = \frac{5 - 13}{2} = \frac{-8}{2} = -4$
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YOU TRY!

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

Directions: Solve each equation using the quadratic formula.

1. $x^2 - 8x = 20$

$$x^2 - 8x - 20 = 0$$

$$a=1, b=-8, c=-20$$

$$x = \frac{8 \pm \sqrt{(-8)^2 - 4(1)(-20)}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{144}}{2} = \frac{8 \pm 12}{2}$$

$$x = \frac{8+12}{2} = 10, x = \frac{8-12}{2} = -2$$

2. $x^2 + 15x = 6x$

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

$$a=1, b=9, c=0$$

$$x = \frac{-9 \pm \sqrt{9^2 - 4(1)(0)}}{2(1)}$$

$$x = \frac{-9 \pm \sqrt{81}}{2} = \frac{-9 \pm 9}{2}$$

$$x = \frac{-9+9}{2} = 0, x = \frac{-9-9}{2} = -9$$

3. $3x^2 + 6x = 9$

$$3x^2 + 6x - 9 = 0$$

$$a=3, b=6, c=-9$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(3)(-9)}}{2(3)}$$

$$x = \frac{-6 \pm \sqrt{144}}{6} = \frac{-6 \pm 12}{6}$$

$$x = \frac{-6+12}{6} = 1, x = \frac{-6-12}{6} = -3$$

4. $2x^2 - 50 = 0$

$$a=2, b=0, c=-50$$

$$x = \frac{0 \pm \sqrt{0 - 4(2)(-50)}}{2(2)}$$

$$x = \frac{\pm \sqrt{400}}{4} = \pm \frac{20}{4}$$

$$x = \frac{20}{4} = 5, x = \frac{-20}{4} = -5$$

5. $7x^2 + 4x + 8 = 0$

$$a=7, b=4, c=8$$

$$x = \frac{-4 \pm \sqrt{4^2 - 4(7)(8)}}{2(7)}$$

$$x = \frac{-4 \pm \sqrt{-208}}{14}$$

No real solution

6. $6x^2 - 7x - 10 = 0$

$$a=6, b=-7, c=-10$$

$$x = \frac{7 \pm \sqrt{(-7)^2 - 4(6)(-10)}}{2(6)}$$

$$x = \frac{7 \pm \sqrt{289}}{12} = \frac{7 \pm 17}{12}$$

$$x = \frac{7+17}{12} = 2, x = \frac{7-17}{12} = -\frac{5}{6}$$

Answers:

1. $a=1, b=-8, c=-20; x=-2, x=10$

3. $a=3, b=6, c=-9; x=1, x=-3$

5. $a=7, b=4, c=8; \text{ No Solution}$

2. $a=1, b=9, c=0; x=0, x=-9$

4. $a=2, b=0, c=-50; x=5, x=-5$

6. $a=6, b=-7, c=-10; x=2, x=-\frac{5}{6}$