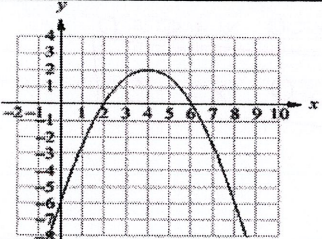


Name: _____ Date: _____

5 Methods to Solving Quadratics

Solve each quadratic equation using the method in the left column.

Method	Problem	When to Use:
Graphing		When they provide the graph or explicitly tell you to graph it.
Factoring 1. Get in standard form. 2. Factor. 3. Set each factor equal to zero and solve.	$x^2 - 7x + 10 = 0$ $(x - 5)(x - 2) = 0$ $x - 5 = 0; x - 2 = 0$ $x = 5; x = 2$	IF it can be factored. (guess & check)
Complete the Square 1. Put terms with an x on the left. 2. Make sure a = 1. 3. Find the number that completes the square. 4. Add it to both sides. 5. Factor the left. Simplify the right. 6. Take the square root of each side. 7. Solve for x.	$x^2 - 10x + 18 = 0$ $x^2 - 10x = -18$ $x^2 - 10x + 25 = -18 + 25$ $(x - 5)^2 = 7$ $x - 5 = \pm\sqrt{7}$ $x = 5 \pm \sqrt{7}$	IF a = 1 and b is even.
Quadratic Formula 1. Put it in standard form. 2. Identify a, b, and c. 3. Use the formula. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$2x^2 - 5x + 3 = 0$ $x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(3)}}{2(2)}$ $x = \frac{5 \pm \sqrt{1}}{4}$ $x = \frac{5}{4} \pm \frac{1}{4} = \frac{6}{4}, \frac{4}{4} = \left(\frac{3}{2}, 1\right)$	Any quadratic, any time, no exceptions.
Square Roots 1. Isolate the square. 2. Take the square root of both sides. 3. Don't forget the ±. 4. Get the variable by itself.	$\sqrt{(x - 2)^2} = \sqrt{5}$ $x - 2 = \pm\sqrt{5}$ $+2 \quad +2$ $x = 2 \pm \sqrt{5}$	IF there is no b term, or you have a parentheses with a 2 on it.

Determine the best way to solve (factoring, square root, completing the square or quadratic formula). Then solve the following equations.

1. $x^2 - 12x + 20 = 0$

Method: *Factor*

$$(x-10)(x-2) = 0$$

$$x-10=0 \quad | \quad x-2=0$$

$$x=10 \quad | \quad x=2$$

2. $5x^2 + 25x = 0$

Method: *Factor*

$$5x(x+5) = 0$$

$$5x=0 \quad | \quad x+5=0$$

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

3. $x^2 + 10x - 3 = 0$

Method: *Completing the square*

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

$$x^2 + 10x + 25 = 3 + 25$$

$$(x+5)^2 = 28$$

$$x+5 = \pm\sqrt{28}$$

$$x = -5 \pm 2\sqrt{7}$$

4. $3x^2 + 81 = 96$

Method: *Square roots*

$$3x^2 + 81 = 96$$

$$3x^2 = 15$$

$$x^2 = 5$$

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

5. $2x^2 + 11x + 5 = 0$

Method: *Factor*

$$(2x+1)(x+5) = 0$$

$$2x+1=0 \quad | \quad x+5=0$$

$$2x=-1 \quad | \quad x=-5$$

$$x = -\frac{1}{2} \quad | \quad x = -5$$

6. $x^2 - 20x - 105 = -9$

Method: *Completing the square*

$$x^2 - 20x = 96$$

$$x^2 - 20x + 100 = 96 + 100$$

$$(x-10)^2 = 196$$

$$x-10 = \pm 14$$

$$x = 10 \pm 14$$

$$x = 24, -4$$

7. $3x^2 + 5x = -11$

Method: *Quadratic formula*

$a=3$

$b=5$

$c=11$

$$3x^2 + 5x + 11 = 0$$

$$x = \frac{-5 \pm \sqrt{(5)^2 - 4(3)(11)}}{2(3)}$$

$$x = \frac{-5 \pm \sqrt{25 - 132}}{6}$$

No real answer

8. $(x-2)^2 - 7 = 3$

Method: *Square roots*

$$(x-2)^2 = 10$$

$$x-2 = \pm\sqrt{10}$$

$$x = 2 \pm \sqrt{10}$$

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

Method: *Quadratic Formula*

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

$$a=3 \quad b=2 \quad c=-3$$

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

$$x = \frac{-2 \pm \sqrt{40}}{6}$$

$$x = \frac{-2}{6} \pm \frac{\sqrt{40}}{6}$$

$$x = -\frac{1}{3} \pm \frac{2\sqrt{10}}{6}$$

$$x = -\frac{1}{3} \pm \frac{\sqrt{10}}{3}$$