

Name: _____ Date: _____

Solving Quadratic Equations Algebraically Review Packet

Methods
Factoring
Quadratic Formula
Completing the Square

Directions: Try solving the following quadratic equations using the following methods.

	Factor	Quadratic Formula	Completing the Square
$x^2 - 4x - 12 = 0$			
$x^2 + 11x + 10 = 0$			
$x^2 - 6x - 16 = 0$			

	Factor	Quadratic Formula	Completing the Square
$2x^2 - 3x - 5 = 0$			

Based on your work, explain when it would be best to use each method.

Directions: You have learned several methods for solving a quadratic equation. Explain which method would be best to solve the following quadratic equations, then solve the quadratic.

(a) $x^2 + 5x - 24 = 0$	(b) $x^2 - 6x + 2 = 0$
(c) $2x^2 + 3x - 5 = 0$	(d) $x^2 - 100 = 0$

FACTORING**Directions:** Solve the following quadratics by factoring.

1) $x^2 - 9x = 0$

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

3) $2x^2 - 98 = 0$

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

5) $2x^2 + 11x + 9 = 0$

6) $2x^2 = 6 - x$

7) $x^3 - 2x^2 - 3x = 0$

8) $2x^3 + 18x^2 - 72x = 0$

QUADRATIC FORMULA

Directions: Solve the following quadratics by using the quadratic formula.

9) $x^2 + 7x + 10 = 0$

10) $2x^2 + 9x + 4 = 0$

11) $3x^2 = 2 - 5x$

12) $4x^2 = 144$

COMPLETING THE SQUARE

Directions: Solve the following quadratics by completing the square.

13) $x^2 - 2x = 15$

14) $x^2 - 4x - 5 = 0$

15) $2x^2 + 20x + 48 = 0$

16) $2x^2 + 5x - 7 = 0$

Solving Quadratic Equations

METHOD	FACTORIZING	QUADRATIC FORMULA	COMPLETING THE SQUARE
When to Use It +	When given a factorable trinomial or the difference of two squares.	*This method may be used to solve all quadratic equations. Most often used when you cannot factor.	*This method may be used to solve all quadratic equations. Most often used when you cannot factor and the b value is an even number.
Procedure	- Write the equation in standard form (equal to 0). - Factor the polynomial. - GCF - DOTS - Trinomial ($a = 1$) - Trinomial ($a > 1$) - Set each factor equal to zero. - Solve each resulting linear equation.	- Write the equation in standard form (equal to 0). - Identify a, b, and c. - Substitute into the formula. - Simplify and solve for x.	- Isolate the terms in x on one side of the equation. - Add the square of one half the coefficient of x (b value) to both sides of the equation. - Factor the trinomial on one side of the equal sign and combine like terms on the other side of the equal sign. - Take the square root of both sides of the resulting equation. - Simplify and solve for x.
Examples	<u>Example#1:</u> $x^2 + 5x = 24$ $x^2 + 5x - 24 = 0$ $(x + 8)(x - 3) = 0$ $x + 8 = 0$ or $x - 3 = 0$ $x = -8$ or $x = 3$ <u>Example#2:</u> $3x^2 = 4 - 11x$ $x^2 + 11x - 4 = 0$ $(3x - 1)(x + 4) = 0$ $3x - 1 = 0$ or $x + 4 = 0$ $x = 1/3$ or $x = -4$	<u>Example:</u> $x^2 + 6x = 16$ $x^2 + 6x - 16 =$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{-6 \pm \sqrt{6^2 - 4(1)(-16)}}{2(1)}$ $x = \frac{-6 \pm \sqrt{100}}{2}$ $x = \frac{-6 \pm 10}{2}$ $x = 2$ or $x = -8$	<u>Example:</u> $x^2 + 12x + 2 = 0$ $x^2 + 12x = -2$ (Leading coefficient is a one) $x^2 + 12x + \boxed{36} = -2 + \boxed{36}$ $\left(\frac{12}{2}\right)^2 = 36$ $(x + 6)^2 = 34$ $\sqrt{(x + 6)^2} = \pm\sqrt{34}$ $x + 6 = \pm\sqrt{34}$ $x = -6 \pm \sqrt{34}$