

SOLVING EQUATIONS REVIEW PACKET

NAME: _____

What makes a function quadratic? Circle all quadratic equations:

a) $y = x^2 + 2x + 5$

b) $y = (x + 2)(x - 4)$

c) $y = (x - 6)^2 + 2$

d) $y = 4x + 1$

e) $y = |x - 2| - 7$

f) $y = 5^x$

SECTION 1: FACTOR COMPLETELY

1. $x^2 - 7x + 6$	2. $x^2 - 100$
3. $4x^2 + 81$	4. $25p^2 - 16p$
5. $m^2 - 10m + 21$	6. $y^2 - 3y - 18$
7. $x^2 + 7x + 12$	8. $x^2 + 64$
9. $x^2 - 8x + 16$	10. $16a^2 - 49$

11. $4x^2 + 20x + 25$

12. $9x^2 - 6x + 1$

13. $3x^2 - 75$

14. $3x^2 + 3x - 36$

15. $4x^2 + 20x - 24$

16. $2x^2 - x - 6$

17. $15x^2 + 4x - 4$

18. $24z^2 - 14z - 5$

19. $6x^2 - 11x - 2$

20. $9m^2 - 21m + 6$

SECTION 2: SOLVING EQUATIONS

Use the square root method.

1. $5x^2 - 7 = 60$

2. $x^2 + 16 = 0$

3. $5x^2 + 9 = 134$

4. $2(x+3)^2 + 12 = 4$

Factor and use the zero product property.

5. $(2x + 8)(x - 5) = 0$

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

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

8. $6x^2 + 11x = 10$

Complete the Square.

9. $x^2 - 4x - 12 = 0$

10. $x^2 - 2x - 35 = 0$

11. $x^2 + 6x = 23$

12. $4x^2 - 8x = 40$

Use the Quadratic Formula.

13. $x^2 + 5x - 6 = 0$

14. $2x^2 - 4x + 3 = 0$

15. $2x^2 - x - 4 = 2$

16. $10x^2 + 9 = x$

SOLVING: WHICH METHOD SHOULD YOU USE?

Explain why!

	Equation	A	B	C	D
1	$x^2 + 4x + 3 = 0$	Sq. Roots	Factor/ZPP	Complete Sq.	Quad. Form
2	$5x^2 - 1 = 6$	Sq. Roots	Factor/ZPP	Complete Sq.	Quad. Form
3	$x^2 - 7x + 1 = 0$	Sq. Roots	Factor/ZPP	Complete Sq.	Quad. Form
4	$x^2 + 10x + 4 = 0$	Sq. Roots	Factor/ZPP	Complete Sq.	Quad. Form
5	$x^2 - 14x = 5$	Sq. Roots	Factor/ZPP	Complete Sq.	Quad. Form
6	$5 - 3x^2 = 20$	Sq. Roots	Factor/ZPP	Complete Sq.	Quad. Form
7	$x^2 + x = 10$	Sq. Roots	Factor/ZPP	Complete Sq.	Quad. Form
8	$x^2 - 4x - 12 = 0$	Sq. Roots	Factor/ZPP	Complete Sq.	Quad. Form

Solve: Choose which method is best =>

1. $y = 2(x + 2)^2 + 24$	2. $y = x^2 - 6x + 8$
3. $y = 2x^2 - 5x - 12$	4. $y = x^2 - 12x + 1$

Find the **discriminant** and determine the **number and type** of solutions.

	Discriminant	Number and Type of Solutions
5. $y = 3x^2 - 3x + 2$		
6. $y = x^2 - 10x + 1$		
7. $y = x^2 - 4x + 4$		

8. If $4 - 9i$ is a solution, what must also be a solution? _____

9. If $-17 + 2i\sqrt{3}$ is a solution, what must also be a solution? _____

Quadratic Equations Methods

Name: _____

Period: _____

I. What makes an equation a **quadratic equation**?

II. There are four methods. List them!

A.

B.

C.

D.

III. How can you determine which method to use?

A. USE SQUARE ROOTS METHOD IF:

If the equation has _____ OR _____ ,
(and no _____)

B. FACTOR AND USE THE ZERO PRODUCT PROPERTY IF:

If the equation has _____ AND _____ ,

IF THE FIRST TWO METHODS DON'T WORK, CHOOSE BETWEEN THESE TWO:

C. COMPLETE THE SQUARE IF:

$A = 1$ AND the middle term is _____.

D. USE THE QUADRATIC FORMULA IF:

The middle term is _____.

SECTION 3: SOLVING

<p>1. Square Roots.</p> <p>Use When: An equation has an x^2 or $(x + c)^2$ (but does not have an x)</p> <ol style="list-style-type: none">1. Isolate the x^2.2. Square root both sides.3. Simplify (including the square root!)4. Don't forget the \pm sign!	<p>2. Factor and Zero Product Property.</p> <p>Use When: The equation is factorable.</p> <ol style="list-style-type: none">1. Make sure the equation is in the form: $ax^2 + bx + c = 0$2. Factor completely!3. Set each factor equal to 0.4. Solve.5. Write the solutions together: $x = \underline{\quad}, \underline{\quad}$
<p>3. Complete the Square.</p> <p>Use When: The trinomial is not factorable. $A=1$ and B is even.</p> <ol style="list-style-type: none">1. Make sure the equation is in the form: $Ax^2 + Bx = C$2. Use the formula $\left(\frac{B}{2}\right)^2$ to determine C.3. Add C to both sides.4. Factor the left side of the equation into a binomial squared.5. Take the square root of both sides (don't forget \pm)6. Isolate the x.	<p>4. Quadratic Formula.</p> <p>Use When: The other methods do not apply.</p> <ol style="list-style-type: none">1. Put the equation into standard form: $Ax^2 + Bx + C = 0$2. Find A, B, C.3. Substitute $A, B,$ and C into the quadratic formula. Use parentheses!4. Simplify completely! <p>Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$</p> <p>Discriminant : $b^2 - 4ac$ If negative = 2 imaginary solutions If 0 = one real number solution If positive = 2 real number solutions</p> <p>Recall, $i = \sqrt{-1}$</p>