

SOLVING QUADRATIC EQUATIONS BY FACTORING

PROCEDURE	EXAMPLE #1	EXAMPLE #2	EXAMPLE #3	EXAMPLE #4
	Solve the equation: $x^2 - 7x = -10$	Solve the equation: $x^2 = -4x$	Solve the equation: $8x^2 + 7 = 57$	Solve the equation: $2x^2 + 5x = -3$
STEP 1: Get all terms on Left, Zero on Right				
STEP 2: Factor Left hand Side				
STEP 3: Set Each Factor equal to zero.				
STEP 4: Solve each equation you just made				

Solve the following quadratic equations for x:

(1) $3x^2 = 9x$

(2) $18x^2 + 6 = 104$

(3) $5x^3 - 5x^2 = 100x$

(4) $3x^2 + 2x = 5$

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

$\begin{array}{r} -15 \\ \hline 5 \cdot -3 \end{array}$

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

$\underbrace{\hspace{2em}}_{\text{GCF?}}$
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$$x(3x+5) - 1(3x+5) = 0$$

$\underbrace{\hspace{10em}}_{\text{GCF?}}$

$$(3x+5)(x-1) = 0$$

$3x+5=0$	$x-1=0$
$x = \frac{-5}{3}$	$x=1$

Name: _____

Date: _____

Regents Review: Completing the Square

Algebra 1

(Let $y = 0$)

I. Find the zeros for the following functions by completing the square and sketch the graph.

(1) $f(x) = x^2 - 8x + 11$

(2) $f(x) = -x^2 + 6x - 2$

(3) $f(x) = 3x^2 - 30x - 9$

(4) $f(x) = 4x^2 - 16x + 8$

$0 = 3x^2 - 30x - 9$
 $+9 \qquad \qquad \qquad +9$

$\frac{9}{3} = \frac{3x^2 - 30x}{3}$

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

$(\frac{-10}{2})^2 = (-5)^2 = 25$

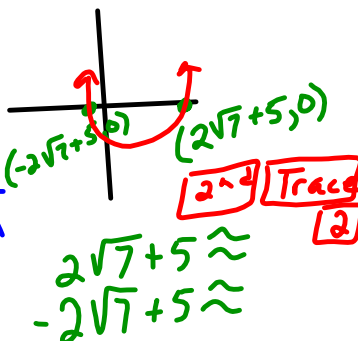
$\pm \sqrt{28} = \sqrt{(x-5)^2}$

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

$\pm \sqrt{4 \cdot 7}$

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

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



- 1
- 4
- 9
- 16
- 25
- 36
- 49

Vertex Form: $f(x) = a(x-h)^2 + k$
 (h, k) Vertex

II. Find the vertex for the following quadratic functions by using the axis of symmetry formula and verify by completing the square. Sketch the graph.

Axis of Symmetry: $x = -\frac{b}{2a}$

(5) $f(x) = x^2 + 4x + 3$

(6) $f(x) = -x^2 - 16x - 7$

(7) $f(x) = 2x^2 - 24x$

(8) $f(x) = -5x^2 - 10x - 1$

a) $x = -\frac{b}{2a} = -\frac{(-10)}{2(-5)} = \frac{10}{-10} = -1$

$f(-1) = -5(-1)^2 - 10(-1) - 1$
 $-5(1) + 10 - 1 = 4$

$f(x) = a(x-h)^2 + k$ (-1, 4) Vertex

b) $f(x) = -5x^2 - 10x - 1$

$\frac{f(x)+1}{-5} = \frac{-5x^2 - 10x}{-5}$

$\frac{1}{-5} + \frac{f(x)}{-5} - \frac{1}{5} = x^2 + 2x + \frac{1}{5}$

$(\frac{2}{2})^2 = 1^2 = 1$

$5 \cdot 1 - \frac{f(x)}{5} - \frac{1}{5} = 5(x+1)^2$

$f(x) = a(x-h)^2 + k$

$5 - \frac{f(x)+1}{5} = 5(x+1)^2$

$-\frac{f(x)+1}{5} = 5(x+1)^2 - 4$

$-\frac{f(x)}{5} = \frac{5(x+1)^2 - 4}{5}$

$a(x-h)^2 + k$

$f(x) = -5(x+1)^2 + 4$

(-1, 4) Vertex