

Name _____

Date _____

Advanced Algebra

Unit 4: Quadratics

Homework Week #1

Please start to read in your Green book 360 through 389

Everybody should be able to do all problems involving Quadratic Formula

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

Monday 12/3/2018 : "I can move between the forms of a quadratic". Fill in the missing forms:

General Form	Factored Form	Vertex Form
$x^2 + 14x + 45$	$(x+9)(x+5)$ -9, -5	$y = 1(x+7)^2 - 4$
$8x^2 + 24x - 144$ $x^2 + 3x - 18$	$8(x-3)(x+6)$ $8x^2 + 24x - 144$ $8(x^2 + 3x - 18)$	$y = (x+1.5)^2 - 16.2$
$x^2 - 4x$	$x(x-4)$	$(x-2)^2 - 4$

$3 \cdot -6 = -18$
 $-\frac{3}{2} = -1.5$

For the following problems, factor and use the mid-point method to find the x intercepts, vertex and y intercept. Make a sketch of each graph:

1) $y = x^2 + 14x + 40$

2) $f(x) = x^2 - 4x - 32$ $(x-8)(x+4)$ Roots 8 and -4 Vertex $\frac{8+(-4)}{2} = 2$ VARS(2) -36

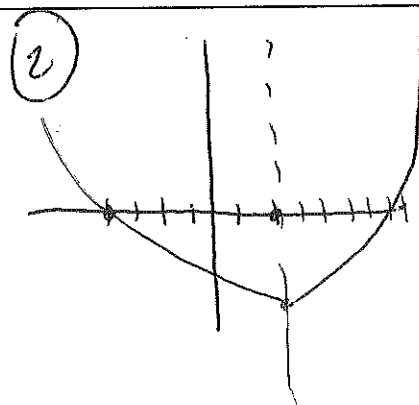
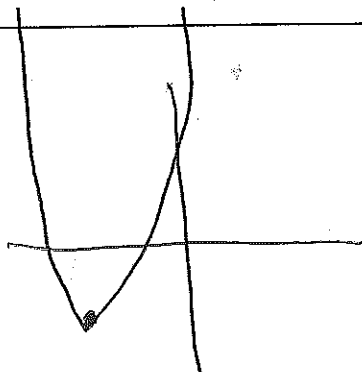
3) $f(x) = x^2 + 10x + 24$

① $(x+10)(x+4)$

Roots -10 and -4

Vertex -7, -9

$y = (x+7)^2 - 9$



Tuesday 12/4/2018: "I can move between the forms of a quadratic" Fill in the missing forms:

we typically don't write factored form if adjacent factor to integers

General Form	Factored Form	Vertex Form
$6x^2+14x+8$	$y = 6(x+1)(x+1.33)$	$y = 6(x+1.165)^2 - 0.1665$
$3x^2-12x+12-5$ $3(x^2-4x+4)-5$	Does Not Factor $\frac{12 \pm \sqrt{144-4(9)(-7)}}{6}$ $\frac{12 \pm 7.7}{6}$ 3.28 .71 Roots	$3(x-2)^2-5$
$4x^2-24x-160$ $4(x^2-6x-40)$ $4(x^2-6x-40)$	$4(x-10)(x+4)$ Roots are 10 and -4	$y = 4(x-3)^2 - 196$ $\frac{10+4}{2} = \frac{6}{2} = 3$ VARS(3)

$\frac{-1 \pm 1.33}{2}$
-1.165

Solve by using the quadratic formula $y = 3x^2 - 5x + 1$

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

$\frac{-14 \pm \sqrt{14^2 - 4(6)(8)}}{12}$

$\frac{-14 \pm 2}{12}$ -1
-1.33

The x values or the roots or answers are: 1.43 and .233

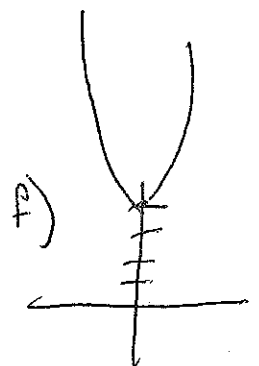
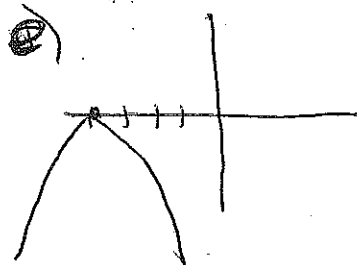
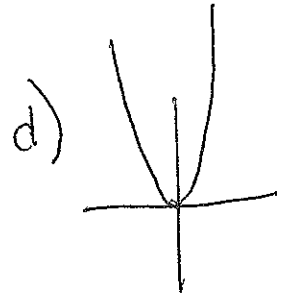
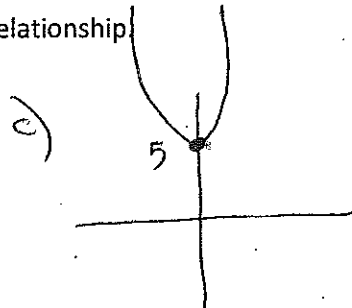
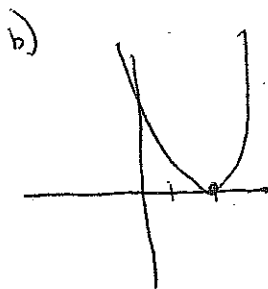
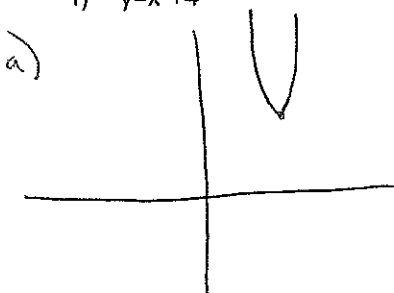
$25 - 4(3)(1) = 13$ This tells me 2 Roots

Review from Unit 2:

$\frac{5 \pm \sqrt{13}}{6}$ $\frac{5 \pm 3.6}{6}$ 1.43
.233

Sketch the following parabolas. Remembering your shifts that we talked about in Unit 2 and that the parent graph of $y=x^2$ is a parabola though (0,0) with a 1-1 relationship

- a) $f(x) = 2(x-3)^2 + 5$
- b) $y = (x-2)^2$
- c) $f(x) = 2x^2 + 5$
- d) $y = 3x^2$
- e) $y = -(x+4)^2$
- f) $y = x^2 + 4$



Wednesday 12/05/2018 "I can find the x intercepts, vertex, and y intercept. I can do this by finding the roots. Once I find the roots, I can add the roots together and divide by 2. This will give me the x coordinate of the vertex or the middle of the parabola. Then I can do VARS (middle) to get the corresponding y value.

General Form	Roots	Vertex	Y intercept	Vertex Form
$x^2+14x+40$ $(x+10)(x+4)$	-10 And -4	$(-7, -9)$ $\frac{-10+4}{2} = -7$	$(0, 40)$	$y = (x+7)^2 - 9$
$x^2-4x-32$ $(x-8)(x+4)$	8 And -4	$(2, -36)$ $\frac{8+4}{2} = \frac{12}{2} = 6$	$(0, -32)$	$y = (x-2)^2 - 36$
$x^2+10x+24$ $(x+6)(x+4)$	-6 And -4	$(-5, -1)$ $\frac{-6+4}{2} = \frac{-2}{2} = -1$	$(0, 24)$	$y = (x+5)^2 - 1$

Thursday 12/06/2018 "I can write the equation of a parabola"

- 1) A parabola touches the x axis at 3 and passes through the point (-2, 25). Write the equation in both vertex and standard form:

Vertex form $y = (x-3)^2 + 0$

General form $x^2 - 6x + 9$

$y = a(x-3)(x-3)$

$25 = a(-2-3)(-2-3)$

$25 = 25a$

$1 = a$

$y = (x-3)(x-3)$

Factored

- 2) A parabola cuts the y axis at -240 and has roots at 6 and -10

$y = a(x-6)(x+10)$

$-240 = a(0-6)(0+10)$

$-240 = -60a \quad a = 4$

$(0, -240)$

$y = 4(x-6)(x+10)$

- 3) A parabola has roots at 6 and -12 and passes through the point (7, 95)

$y = a(x-6)(x+12)$

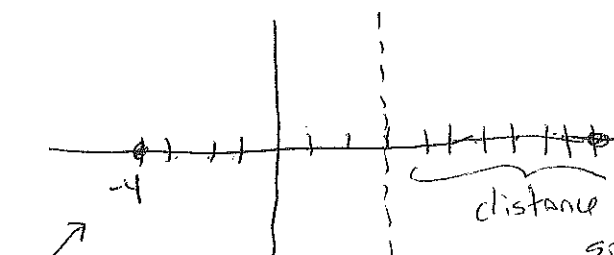
$95 = a(7-6)(7+12)$

$95 = 19a \quad a = 5$

$y = 5(x-6)(x+12)$

- 4) A parabola has a x coordinate of the vertex at 3. One of the roots is 10. It passes through the point (9, -26)

A picture might help



other root
This comes from Analyzing

$y = a(x+4)(x-10)$

$-26 = a(9+4)(9-10)$

$-26 = -13a \quad a = 2$

$y = 2(x+4)(x-10)$

distance from vertex is 7

so go 7 the other way because a parabola is symmetric?