Cornell Notes	Topic/Objective: 2.4 Graphs of Quadratics	Name:
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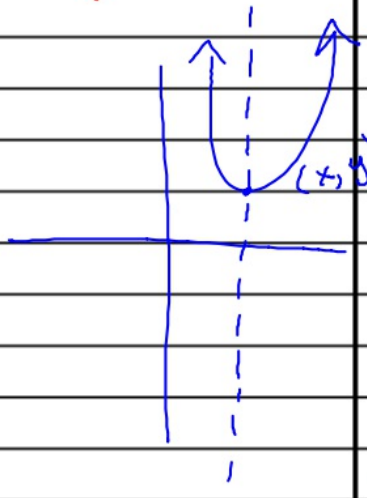
		Date: 11/28/16

Essential Question: What special features do graphs of Quadratics have?

Questions:

$b^2-4ac > 0$ 2 real diff roots
< 0 no real roots
$= 0$ 2 same

positive vertex in II 2 x-int.
doesn't touch x (+) vertex I
touches x-axis



Notes:

Investigation:
i. find the value of b^2-4ac
ii. Graph on Calculator

How does the discriminant relate to the graph?

		disc
a.	$y = x^2 - 3x - 5$	$9+20 = 29$
b.	$y = x^2 + 2x + 7$	$(2)^2 - 4(1)(7) = 4-28 = -24$
c.	$y = x^2 - 6x + 9$	$(-6)^2 - 4(9) = 0$
d.	$y = -x^2 + 5x + 2$	$25 - 2(-1)4 = 25+8 = 33$
e.	$y = 3x^2 - 6x + 4$	$(-6)^2 - 4(3)(4) = 36-48 = -12$
f.	$y = 4x^2 + 3x + 5$	$(3)^2 - 4(4)(5) = -71$
g.	$y = 2x^2 - 4x + 2$	$(-4)^2 - 4(2)(2) = 0$
h.	$y = x^2 + 7x + 3$	$(7)^2 - 4(1)(3) = 37$

For quadratic functions in standard form ($y = ax^2 + bx + c$), the graph crosses the y-axis at $(0, c)$ and the equation of the axis of symmetry is $x = \frac{-b}{2a}$

when the basic equation $y = x^2$ undergoes transformations, the resulting function can be written in the form

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

- a: vert stretch
- h: horizontal shift
- k: vertical shift

vertex: (h, k)

"The Vertex form"

Example

place $y = x^2 - 6x + 4$ in the form $y = (x-h)^2 + k$

Sketch and label the vertex and y-int.

$y = x^2 - 6x + 9 - 9 + 4$

$b = -6$

$\frac{b}{2} = \left(\frac{-6}{2}\right) = -3$

$\left(\frac{b}{2}\right)^2 = (-3)^2 = 9$