Algebra 1 9.1

Analyze characteristics of graphs of quadratic functions

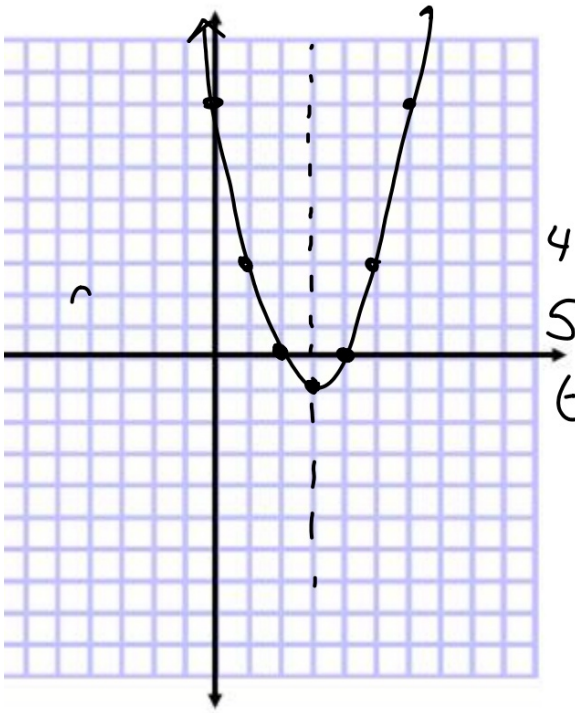
Graph quadratic functions

.

$a=1 \quad b=-6 \quad c=8$

x^2-6x+8

$= \frac{b}{2a} = \frac{6}{2 \cdot 1} = 3$



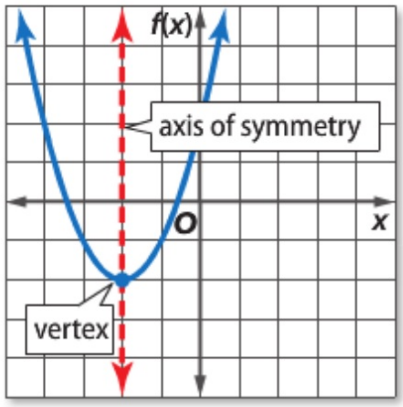
	x^2-6x+8	
	$8+8$	$=1$
4	$16-24+8$	0
5	$25-30+8$	3
6	$36-36+8$	8

If a is positive...

If a is negative...

KeyConcept Quadratic Functions

Parent Function:	$f(x) = x^2$
Standard Form:	$f(x) = ax^2 + bx + c$
Type of Graph:	parabola
Axis of Symmetry:	$x = -\frac{b}{2a}$
***y*-intercept:**	c



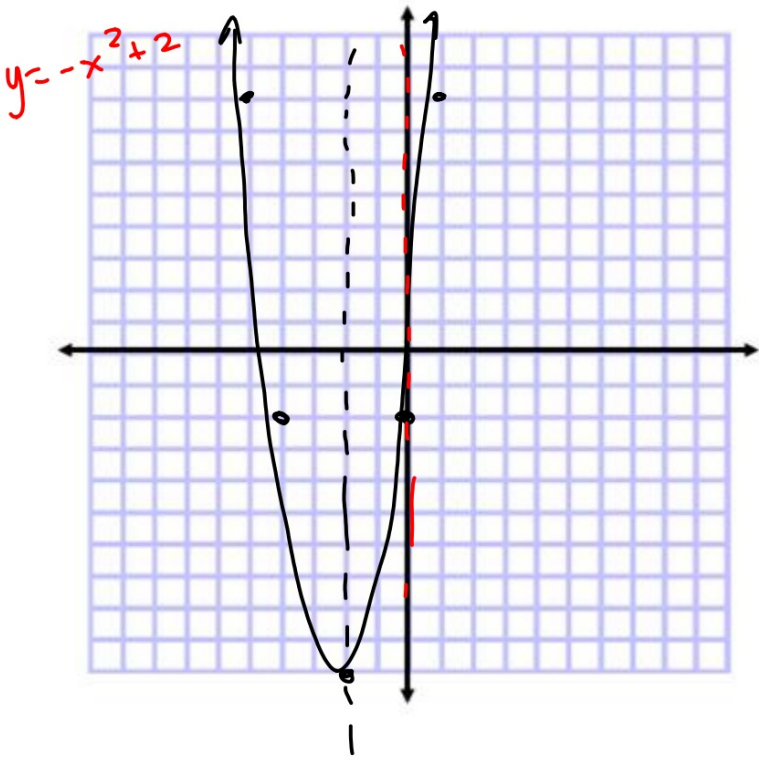
Whiteboards (?)

$a=2 \quad b=8 \quad c=-2$

$y = 2x^2 + 8x - 2$

A.O.S $x = \frac{-8}{2 \cdot 2} = -\frac{8}{4} = -$

	$2xx+8x-2$	
-2	$2\cdot(-2)+8\cdot(-2)-2$ $8-16-2$	-10
0	$2\cdot0\cdot0+8\cdot0-2$	-2
2	$2\cdot2\cdot2+8\cdot2-2$ $8+16-2$	22
1	$2\cdot1\cdot1+8\cdot1-2$ $2+8-2$	8



KeyConcept Maximum and Minimum Values

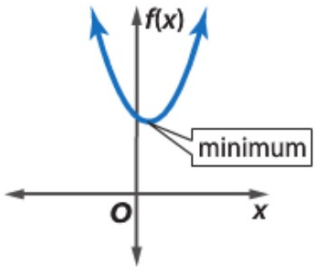
Words

The graph of $f(x) = ax^2 + bx + c$, where $a \neq 0$:

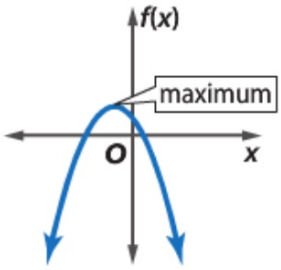
- opens upward and has a minimum value when $a > 0$, and
- opens downward and has a maximum value when $a < 0$.
- The range of a quadratic function is all real numbers greater than or equal to the minimum, or all real numbers less than or equal to the maximum.

Examples

a is positive.



a is negative.



~~Use a table of values to graph~~

4. $y = x^2 - 5$ $a=1$ $b=0$ $c=-5$

	$x \cdot x - 5$	
0	$0 \cdot 0 - 5$	-5

Vertex $(0, -5)$

A.o.S. $\frac{-0}{2 \cdot 1} = 0$ $x = 0$

y-int $(0, -5)$

$y = -x^2 + 3$

$-1 \cdot x \cdot x$

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

WB (prac.)
1-12

7. $y = -x^2 + 5x + 6$

$y=x^2-4x+3$