

# 7.1/2 Properties of Graphs of Quadratic Functions( Day1)- Concept #5/6

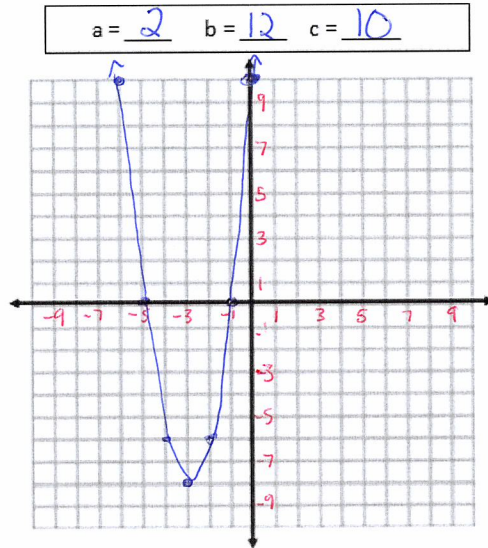
## PART 1:

- Complete the table in column 1
- Graph the ordered pairs from the table onto the graph in column two. Join the points in a smooth curve
- Ignore column 3 for now.....

THE FUNCTION USING A TABLE			THE GRAPH	THE CHARACTERISTICS
x	$y = -2x^2 - 8x - 9$	y	$a = -2 \quad b = -8 \quad c = -9$	X Intercept: None Y Intercept: $(0, -9)$ Vertex: $(-2, -1)$ Is the Vertex a Maximum or Minimum? Max. Axis of Symmetry: $x = -2$ Domain: $\{x \mid x \in \mathbb{R}\}$ Range: $\{y \mid y \leq -1, y \in \mathbb{R}\}$
-4	$y = -2(-4)^2 - 8(-4) - 9$ $y = -2(16) + 32 - 9$	-9		
-3	$y = -2(-3)^2 - 8(-3) - 9$ $= -2(9) + 24 - 9$	-3		
-2	$y = -2(-2)^2 - 8(-2) - 9$ $= -2(4) + 16 - 9$	-1		
-1	$y = -2(-1)^2 - 8(-1) - 9$ $= -2(1) + 8 - 9$	-3		
0	$y = -2(0)^2 - 8(0) - 9$ $=$	-9		
1	$y = -2(1)^2 - 8(1) - 9$ $y = -2 - 8 - 9$			
2	$y = -2(2)^2 - 8(2) - 9$ $= -2(4) - 16 - 9$			

THE FUNCTION USING A TABLE			THE GRAPH	THE CHARACTERISTICS
x	$y = -x^2 + 2x - 5$	y	$a = -1 \quad b = 2 \quad c = -5$	X Intercept: none Y Intercept: $(0, -5)$ Vertex: $(1, -4)$ Is the Vertex a Maximum or Minimum? Maximum Axis of Symmetry: $x = 1$ Domain: $\{x \mid x \in \mathbb{R}\}$ Range: $\{y \mid y \leq -4, y \in \mathbb{R}\}$
-2	$y = -(-2)^2 + 2(-2) - 5$ $= -4 - 4 - 5$	-13		
-1	$y = -(-1)^2 + 2(-1) - 5$ $= -1 - 2 - 5$	-8		
0	$y = 0 + 0 - 5$	-5		
1	$y = -(1)^2 + 2(1) - 5$ $= -1 + 2 - 5$	-4		
2	$y = -(2)^2 + 2(2) - 5$ $= -4 + 4 - 5$	-5		
3	$y = -(3)^2 + 2(3) - 5$ $= -9 + 6 - 5$	-8		
4	$y = -(4)^2 + 2(4) - 5$ $= -16 + 8 - 5$	-13		

x	$y = 2x^2 + 12x + 10$	y
-6	$y = 2(-6)^2 + 12(-6) + 10$ $= 72 - 72 + 10$	10
-5	$y = 2(-5)^2 + 12(-5) + 10$ $= 2(25) + (-60) + 10$	0
-4	$y = 2(-4)^2 + 12(-4) + 10$ $= 32 - 48 + 10$	-6
-3	$y = 2(-3)^2 + 12(-3) + 10$ $= 18 - 36 + 10$	-8
-2	$y = 2(-2)^2 + 12(-2) + 10$ $= 8 - 24 + 10$	-6
-1	$y = 2(-1)^2 + 12(-1) + 10$ $= 2 - 12 + 10$	0
0	$y = 2(0)^2 + 12(0) + 10$	10



X Intercept:

Y Intercept:

Vertex:

Is the Vertex a Maximum or Minimum?

Axis of Symmetry:

Domain:

Range:

## PART 2:

Q: What pattern do you see in the above graphs? How does the value of 'a' affect the graph? What does the value of 'c' tell you about the graph?

The value of "a" determines if the graph opens up or down.

If  $a > 0$  the parabola opens up

If  $a < 0$  the parabola opens down

The value of "c" is equal to the y-intercept of the graph.