

Graphing Quadratic Functions

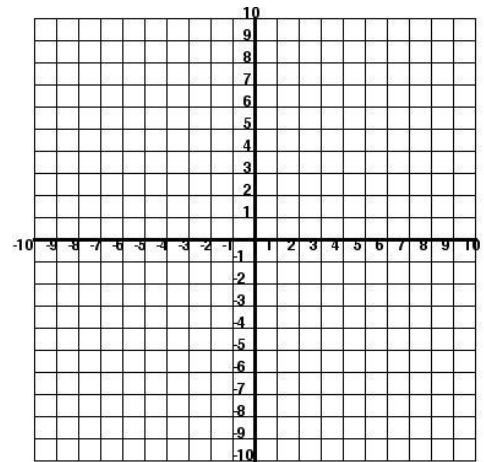
- 1) Complete the following table for the function given below and sketch the points and connect the dots with a smooth curve. Answer the questions that follow using page 236.

$$y = x^2$$

Graph:

Table:

X	-6	-4	-2	0	2	4
Y						



- a) What is a parabola?
- b) What is a vertex?
- c) What is an axis of symmetry?
- d) Pinpoint these items on the graph you made

Notes Section:

A quadratic function is given by: $y = ax^2 + bx + c$

For each of the questions below complete the tables and sketch the graphs

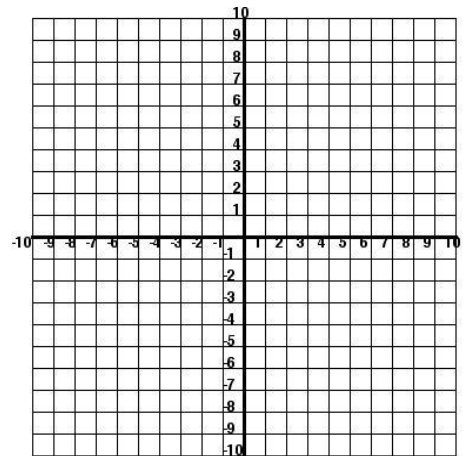
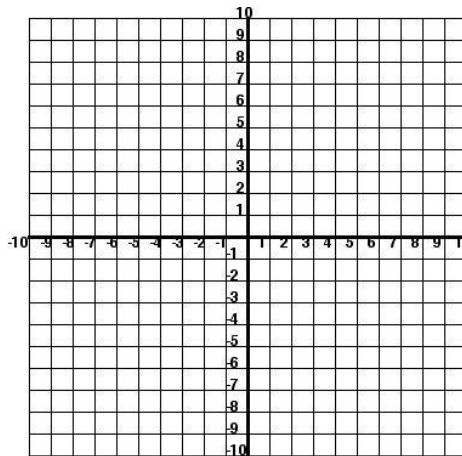
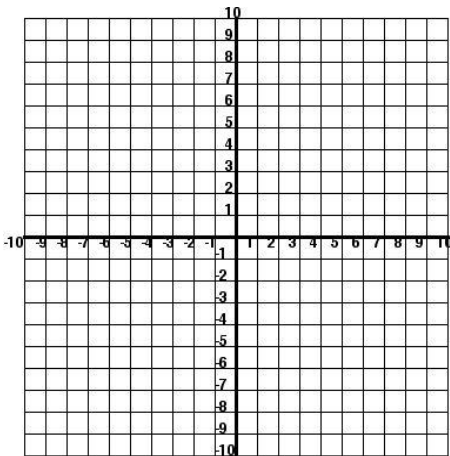
2) Complete the tables, graphing the functions and answer the questions. (Use the calculator)

Input value	Output $y = x^2 - 2x - 1$	Output $y = 3x^2 - 2x - 1$	Output $y = (1/4)x^2 - 2x - 1$
-4			
-3			
-2			
-1			
0			
1			
2			
3			
4			

graph $y = x^2 - 2x - 1$

Graph $y = 3x^2 - 2x - 1$

Graph $y = \frac{1}{4}x^2 - 2x - 1$



How did changing the a-value to a number greater than one affect the graph?

How did changing the a-value to a number between zero and one affect the graph?

Do the graphs open up or down? Is the vertex of each of these graphs a maximum output or a minimum output?

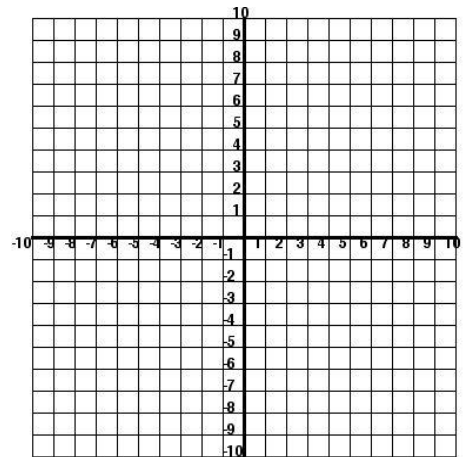
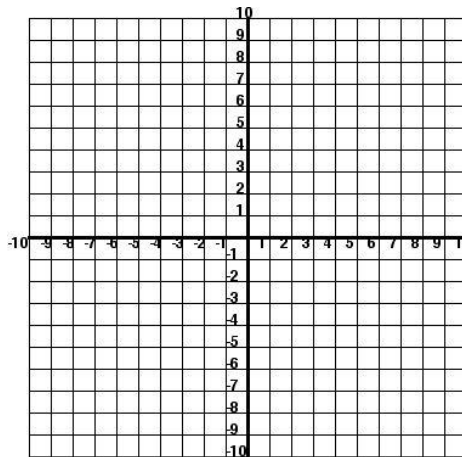
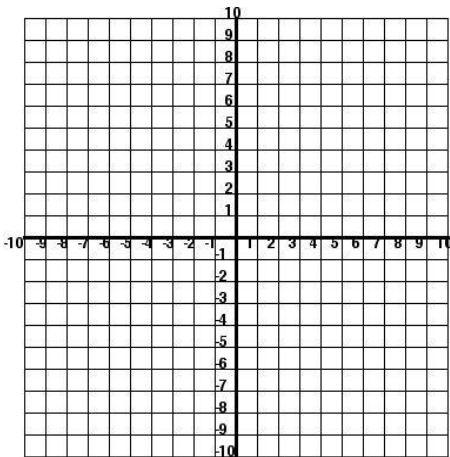
3) Complete the tables, graphing the functions and answer the questions. Feel free to use the calculator.

Input value	Output $y = -x^2 - 2x + 2$	Output $y = -3x^2 - 2x + 1$	Output $y = -(1/4)x^2 - 2x - 4$
-4			
-2			
0			
2			
4			

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

Graph $y = -3x^2 - 2x + 1$

Graph $y = -\frac{1}{4}x^2 - 2x - 4$



How did making the a-value of each function negative affect the graphs?

Do these graphs with negative a-values open up or down? Is the vertex of each of these graphs a maximum output or a minimum output?

What is the y-intercept of each of these graphs? What is the c-value of each of these graphs?

4) For each function below before you graph it identify the A,B, and C values. Then use those values to predict whether the function will open up or down, whether the function will be wider or narrower than $y = x^2$, what the y-intercept will be, and will the vertex be a maximum or a minimum value. Then graph the function to confirm your predictions.

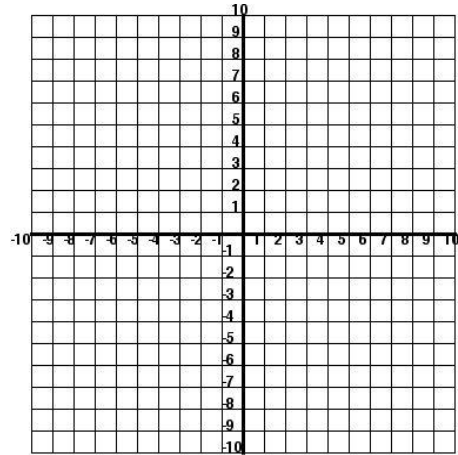
a) $y = -2x^2 - 4$ A: _____ B: _____ C: _____

Does it open up or down? _____

Wider or narrower than $y = x^2$? _____

What is the y-intercept? _____

Is the vertex a maximum or a minimum? _____



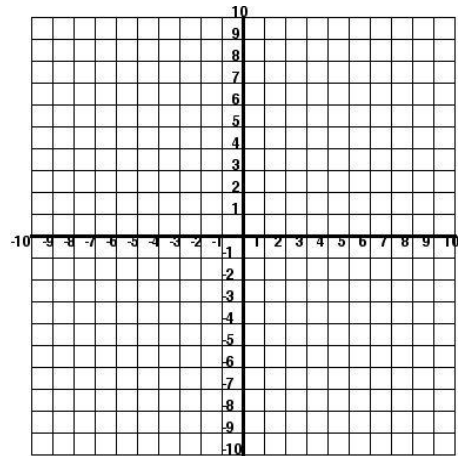
b) $y = 5x^2 - x + 3$ A: _____ B: _____ C: _____

Does it open up or down? _____

Wider or narrower than $y = x^2$? _____

What is the y-intercept? _____

Is the vertex a maximum or a minimum? _____



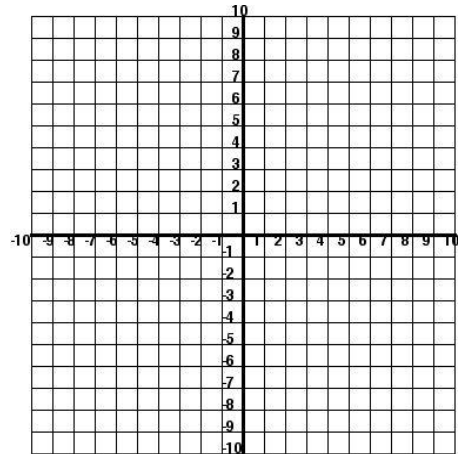
c) $y = (0.5)x^2 - 4x + 3$ A: _____ B: _____ C: _____

Does it open up or down? _____

Wider or narrower than $y = x^2$? _____

What is the y-intercept? _____

Is the vertex a maximum or a minimum? _____



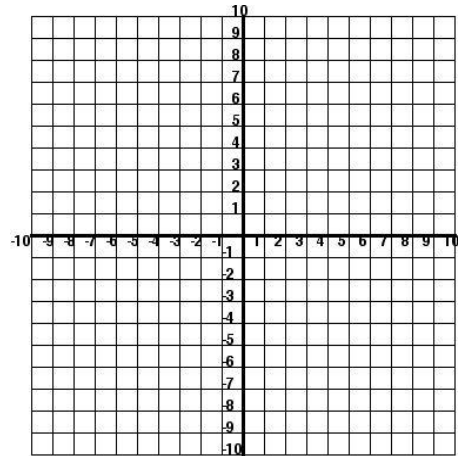
d) $y = \left(\frac{-3}{4}\right)x^2 + x + 6$ A: _____ B: _____ C: _____

Does it open up or down? _____

Wider or narrower than $y = x^2$? _____

What is the y-intercept? _____

Is the vertex a maximum or a minimum? _____



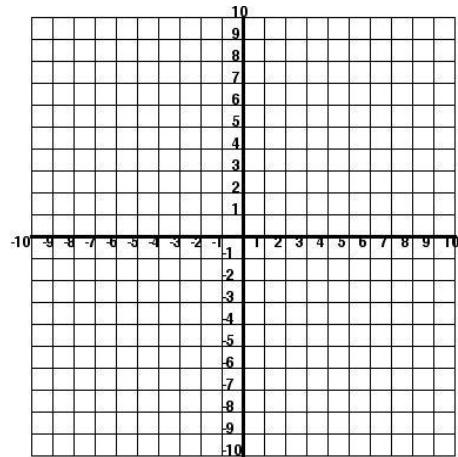
e) $y = 4x^2 + x$ A: _____ B: _____ C: _____

Does it open up or down? _____

Wider or narrower than $y = x^2$? _____

What is the y-intercept? _____

Is the vertex a maximum or a minimum? _____



f) $y = (.01)x^2 + 3.45x - 0.5$ A: _____ B: _____ C: _____

Does it open up or down? _____

Wider or narrower than $y = x^2$? _____

What is the y-intercept? _____

Is the vertex a maximum or a minimum? _____

