Heritage High School – Distance Learning
Mr. Leong's Algebra 1 Assignment Packet
April 13 – April 17

**Due Date:** Monday, April 20 by 9:00am
*Late work will not be accepted*

**Notes:** Included in this packet are some note taking templates. Those with internet access can complete the notes as you watch the YouTube videos linked below.
- Graphing Quadratic Functions
- Identifying Key Features of a Parabola

**Videos:** Videos for the notes:
https://youtu.be/jCocvB3a7D8
https://youtu.be/r994GuLaCrY

Additional videos on graphing quadratic functions:
https://youtu.be/BGz3pkoGPag
https://youtu.be/Cn1aFaxRyeU
https://youtu.be/MDppAkE7UOs
https://youtu.be/utE3aflj-XM

Additional videos on identifying key features of a parabola:
https://youtu.be/UVWTK8P86to
https://youtu.be/VubsLXqjXhE

**Tools:** Check out this Excel based tool created by Mr. Weinert
https://ca01001129.schoolwires.net/Page/15726

**Reading:** Textbook p.420-422, 426-427, 432-434

**Exercises:** Textbook p.470 #1-12
*Please submit your answers through Clever and the Big Ideas Math site.*
*Those without internet access may submit paper copies to the main office.*

**Contact:** leongc@luhsd.net
925.634.0037 ext. 6305
Remind @fnctn
Zoom office hours (TBA)

# *Accessing Big Ideas Through Clever*

The preferred method of completing assignments is electronically through Clever.

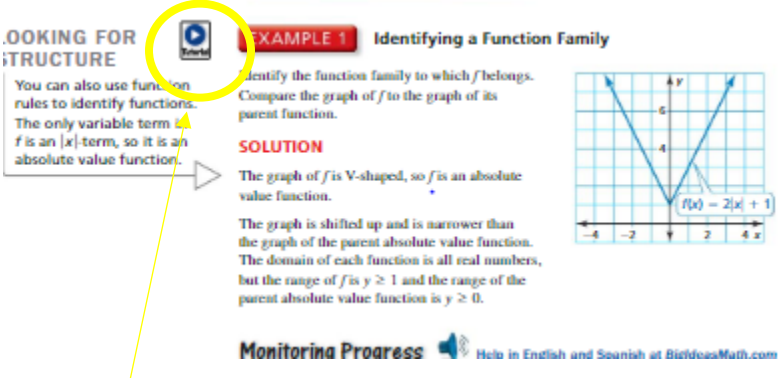
***To access your assignments:***

- Go to “clever.com/in/luhsd”
- Log in using your username and password as your student ID number
- Scroll down to “Math” where you will see the Big Ideas Math logo, click on “Big Ideas Math”
- If you are taking multiple math classes, you may need to select the book for the course you are working
- In the middle there is a tab that says “Assignments,” click on “Assignments”


- Choose an assignment to work on from the list. Click the pencil/enter to start the assignment.
- ***WARNING!!!!*** Clever does NOT automatically save and submit progress. Once you finish the last problem in an assignment, be sure to <u>click your name in the top-right corner and click “Submit”</u> to turn your assignment in.

***To access online tutorial videos:***

- Go to “clever.com/in/luhsd”
- Log in using your username and password as your student ID number
- Scroll down to “Math” where you will see the Big Ideas Math logo, click on “Big Ideas Math”
- If you are taking multiple math classes, you may need to select the book for the course you are working
- Click on “Student Dynamic ebook”
- You can use the “Contents” tab on the left to get to the section you wish to view
- In the section you will see examples that look similar to the below pic:




The blue circle with triangle indicates there is a tutorial video for that example. Click the icon to view.

| Name: | Date: | Period: |
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# NOTES: GRAPHING QUADRATIC FUNCTIONS

| **Steps to Graph a Quadratic Function** | | |
|---|---|---|
| | 1. | |
| | 2. | |
| | 3. | |
| | 4. | |

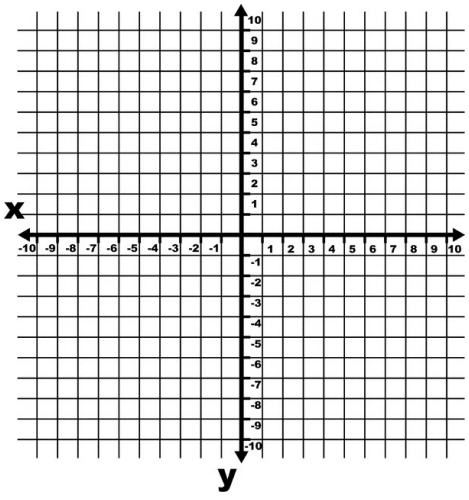
**EXAMPLES: Use the steps listed above to graph the quadratic functions.**

**1. $f(x) = x^2$**

**Axis of Symmetry: _____**

**Vertex: _____**

**Graph:**



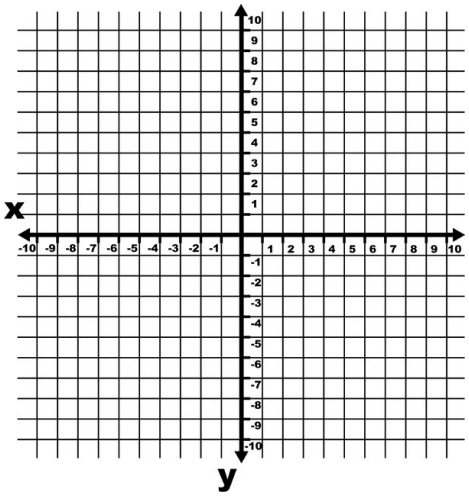

| x | f(x) |
|---|---|
| | |
| | |
| | |
| | |
| | |

## 2. $f(x) = x^2 - 4$

**Axis of Symmetry:** _____

**Vertex:** _____

**Graph:**



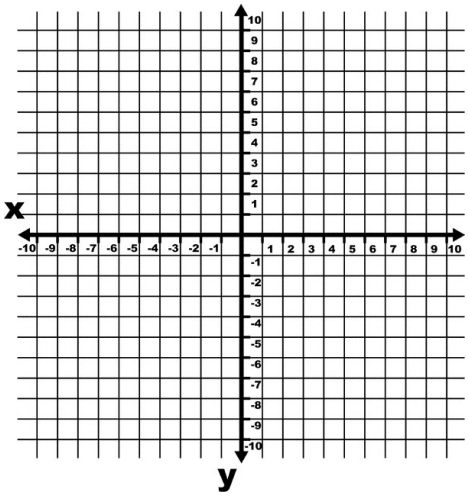

| x | f(x) |
|---|---|
| | |
| | |
| | |
| | |
| | |

## 3. $f(x) = -x^2 + 2x + 3$

**Axis of Symmetry:** _____

**Vertex:** _____

**Graph:**




| x | f(x) |
|---|---|
| | |
| | |
| | |
| | |
| | |

| Name: | Date: | Period: |
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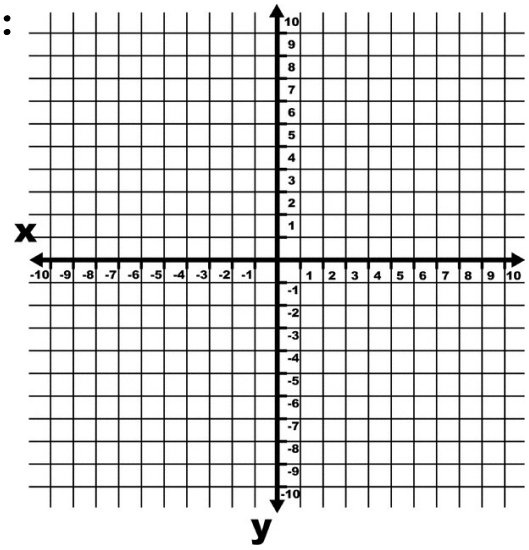
# A.____ Graphing Quadratic Functions

**EXAMPLES: Find the axis of symmetry and vertex for each quadratic function. Then create a table of values and graph.**

**1. $f(x) = 2x^2 + 2x + 1$** **Graph:**

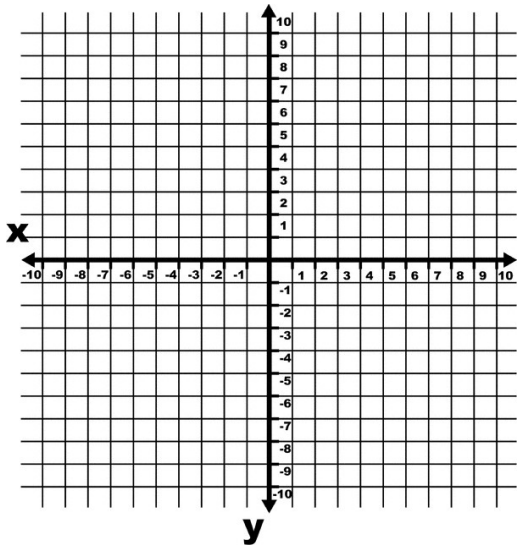



**Axis of Symmetry: _____**

**Vertex: _____**

| x | f(x) |
|---|---|
| | |
| | |
| | |
| | |
| | |

**2. $f(x) = 2x^2 - 4$** **Graph:**




**Axis of Symmetry: _____**

**Vertex: _____**

| x | f(x) |
|---|---|
| | |
| | |
| | |
| | |
| | |

| Name: | Date: | Period: |
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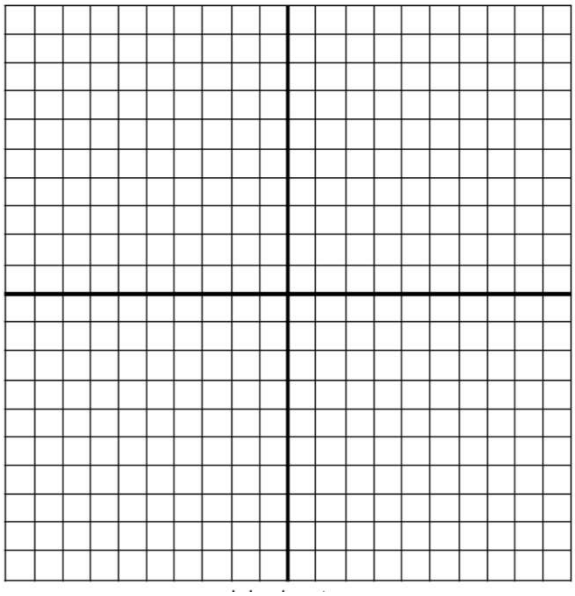
# Notes: Identifying Key Features of a Parabola

**Vocabulary**

| |
|---|
| **Axis of symmetry:** |
| **Vertex:** |
| **x-intercept(s):** |
| **y-intercept:** |
| **Domain:** |
| **Range:** |

**EXAMPLES: Graph the function then identify the parabola's key features.**

1. $f(x) = x^2 + 2$



Axis of Symmetry: _____

Vertex: _____

| x | y |
|---|---|
| | |
| | |
| | |
| | |
| | |

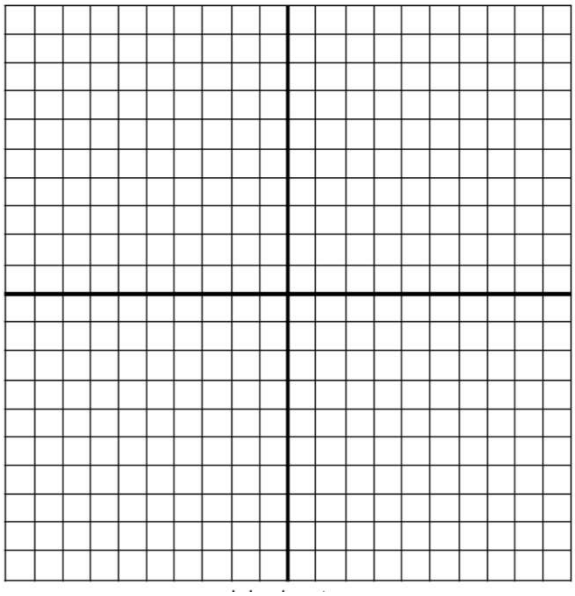
x-intercept(s): _____

y-intercept: _____

Domain: _____

Range: _____

2. $f(x) = x^2 + 2x + 1$



Axis of Symmetry: _____

Vertex: _____

| x | y |
|---|---|
| | |
| | |
| | |
| | |
| | |

x-intercept(s): _____

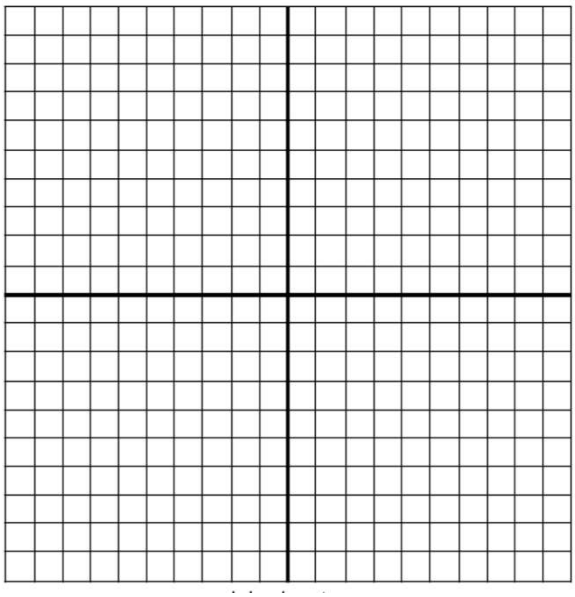
y-intercept: _____

Domain: _____

Range: _____

You Try!!

$f(x) = -x^2 - 4x - 4$



Axis of Symmetry: _____

Vertex: _____

| x | y |
|---|---|
| | |
| | |
| | |
| | |
| | |

x-intercept(s): _____

y-intercept: _____

Domain: _____

Range: _____

| Name: | Date: | Period: |
|---|---|---|

# NOTES: GRAPHING QUADRATIC FUNCTIONS

$ax^2 + bx + c$ ← standard form

| Steps to Graph a Quadratic Function | | |
|---|---|---|
| | 1. | Find the axis of symmetry $x = -b/2a$ |
| | 2. | create a table of values |
| | 3. | plot the ordered pairs |
| | 4. | sketch the graph. |

**EXAMPLES: Use the steps listed above to graph the quadratic functions.**

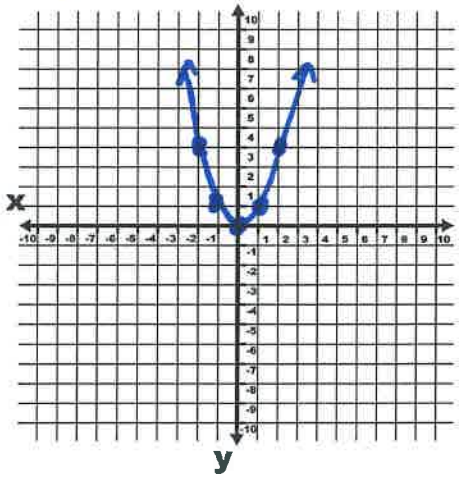
1. $f(x) = 1x^2 + 0x + 0$

(a) (b) (c)

Axis of Symmetry: $x = \frac{-b}{2a} = \frac{-0}{2(1)} = 0$

Vertex: (0,0)

Graph:




| x | f(x) | y |
|---|---|---|
| -2 | $(-2)^2$ | 4 |
| -1 | $(-1)^2$ | 1 |
| 0 | $(0)^2$ | 0 |
| 1 | $(1)^2$ | 1 |
| 2 | $(2)^2$ | 4 |

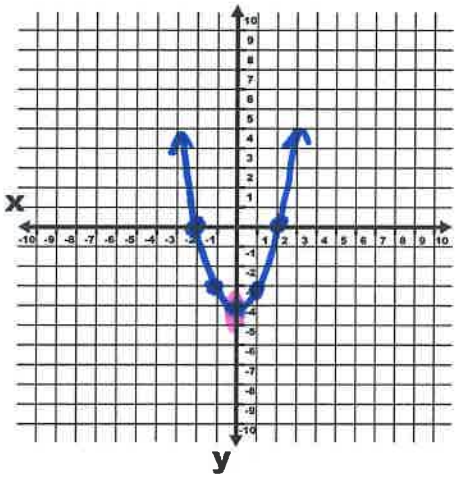
a b c

2. $f(x) = x^2 - 4 = 1x^2 + 0x - 4$

Axis of Symmetry: $x = \frac{-b}{2a} = \frac{-0}{2(1)} = 0$

Vertex: (0, -4)

Graph:




| x | f(x) | y |
|---|---|---|
| -2 | $(-2)^2 - 4$ | 0 |
| -1 | $(-1)^2 - 4$ | -3 |
| 0 | $(0)^2 - 4$ | -4 |
| 1 | $(1)^2 - 4$ | -3 |
| 2 | $(2)^2 - 4$ | 0 |

3. $f(x) = -1x^2 + 2x + 3$

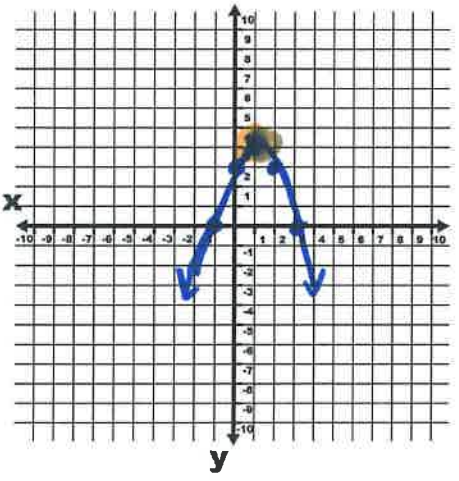
a b c

Axis of Symmetry:

$x = \frac{-b}{2a} = \frac{-(2)}{2(-1)} = \frac{-2}{-2} = 1$

Vertex: (1, 4)

Graph:




| x | f(x) | y |
|---|---|---|
| -1 | $-(-1)^2 + 2(-1) + 3$ | 0 |
| 0 | $-(0)^2 + 2(0) + 3$ | 3 |
| 1 | $-(1)^2 + 2(1) + 3$ | 4 |
| 2 | $-(2)^2 + 2(2) + 3$ | 3 |
| 3 | $-(3)^2 + 2(3) + 3$ | 0 |

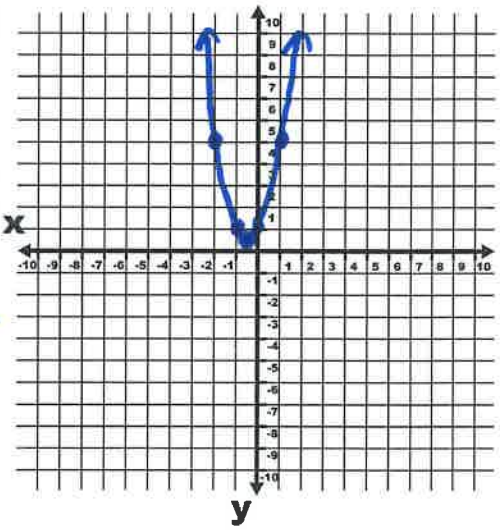
| Name: | Date: | Period: |
|---|---|---|

# A.____ Graphing Quadratic Functions

**EXAMPLES: Find the axis of symmetry and vertex for each quadratic function. Then create a table of values and graph.**

**1.** $f(x) = 2x^2 + 2x + 1$ (a = 2, b = 2, c = 1)

**Graph:**



**Axis of Symmetry:** _____

$x = \frac{-b}{2a} = \frac{-(2)}{2(2)} = -\frac{1}{2}$

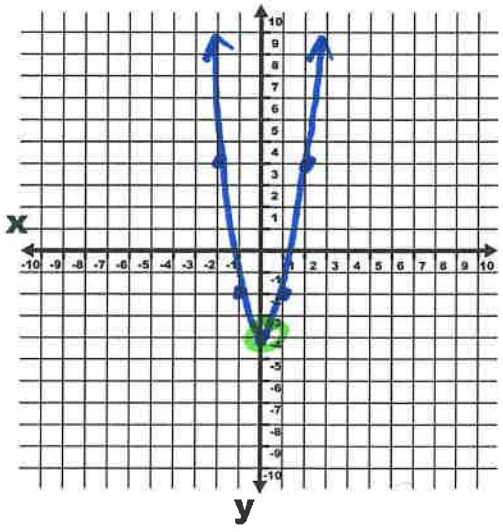
**Vertex:** (-0.5, 0.5)

| x | f(x) | | y |
|---|---|---|---|
| -2 | $2(-2)^2+2(-2)+1$ | | 5 |
| -1 | $2(-1)^2+2(-1)+1$ | | 1 |
| -1/2 | $2(-\frac{1}{2})^2+2(-\frac{1}{2})+1$ | | 0.5 |
| 0 | $2(0)^2+2(0)+1$ | | 1 |
| 1 | $2(1)^2+2(1)+1$ | | 5 |

**2.** $f(x) = 2x^2 + 4$ (a = 2, b = 0, c = 4)

$2x^2 + 0x - 4$

**Graph:**



**Axis of Symmetry:** _____

$x = \frac{-b}{2a} = \frac{-(0)}{2(2)} = 0$

**Vertex:** (0, -4)

| x | f(x) | | y |
|---|---|---|---|
| -2 | $2(-2)^2-4$ | | 4 |
| -1 | $2(-0^2-4$ | | -2 |
| 0 | $2(0)^2-4$ | | -4 |
| 1 | $2(1)^2-4$ | | -2 |
| 2 | $2(2)^2-4$ | | 4 |

| Name: | Date: | Period: |
|---|---|---|

# Notes: Identifying Key Features of a Parabola

## Vocabulary

**AXIS OF SYMMETRY:** $x = -b/2a$ — a vertical line that splits the parabola in half

**VERTEX:** the max/min point on the parabola

**X-INTERCEPT(S):**

**Y-INTERCEPT:** $y = ax^2 + bx + c$ ← $(0, c)$ ← y-int

**DOMAIN:** all real numbers can be used as inputs (x-values)

**RANGE:** the list of outputs (y-values)

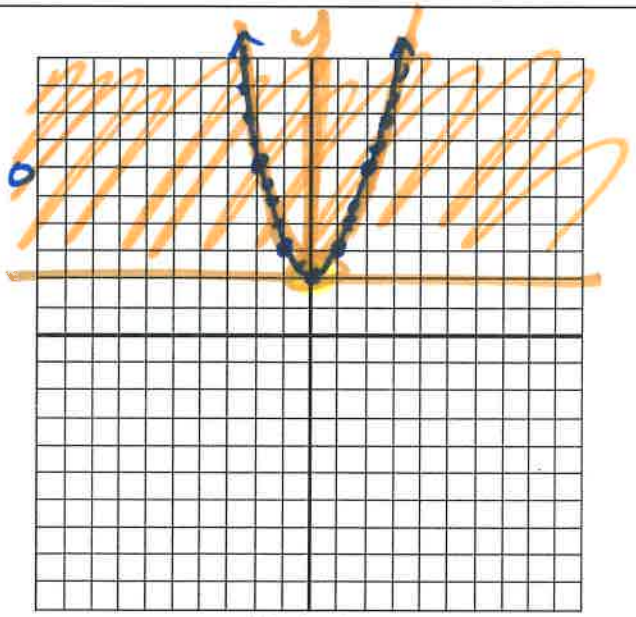
**EXAMPLES: Graph the function then identify the parabola's key features.**

1. $f(x) = x^2 + 2$ $= 1x^2 + 0x + 2$ (a) (b) (c)

Axis of Symmetry: _____

Vertex: $(0, 2)$ $x = \frac{-b}{2a} = \frac{-(0)}{2(1)} = 0$

| x | f(x) | y |
|---|---|---|
| -2 | $(-2)^2 + 2$ | 6 |
| -1 | $(-1)^2 + 2$ | 3 |
| 0 | $(0)^2 + 2$ | 2 |
| 1 | $(1)^2 + 2$ | 3 |
| 2 | $(2)^2 + 2$ | 6 |




x-intercept(s): n/a

y-intercept: $(0, 2)$

Domain: all real numbers

Range: $y \geq 2$

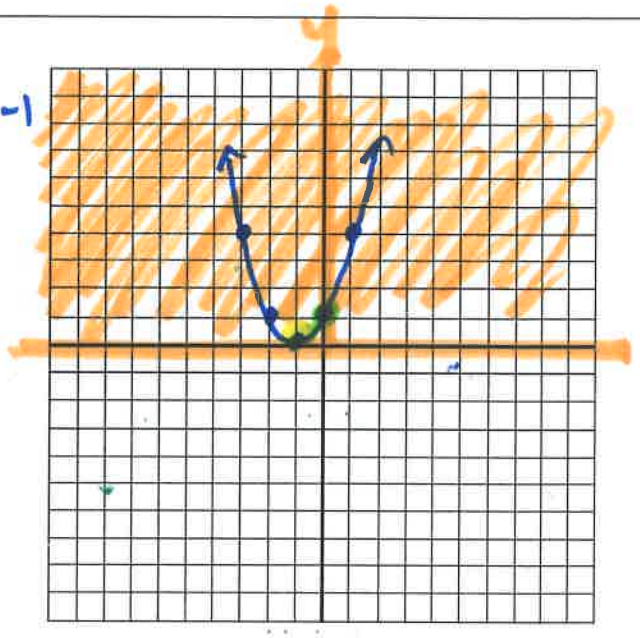
a b c

2. $f(x) = 1x^2 + 2x + 1$

Axis of Symmetry: $x = \frac{-b}{2a} = \frac{-(2)}{2(1)} = -1$

Vertex: $(-1, 0)$

| x | y | y |
|---|---|---|
| -3 | $(-3)^2+2(-3)+1$ | 4 |
| -2 | $(-2)^2+2(-2)+1$ | 1 |
| -1 | $(-1)^2+2(-1)+1$ | 0 |
| 0 | $(0)^2+2(0)+1$ | 1 |
| 1 | $(1)^2+2(1)+1$ | 4 |



x-intercept(s): $(-1, 0)$

y-intercept: $(0, 1)$

Domain: all real numbers

Range: $y \geq 0$

You Try!!

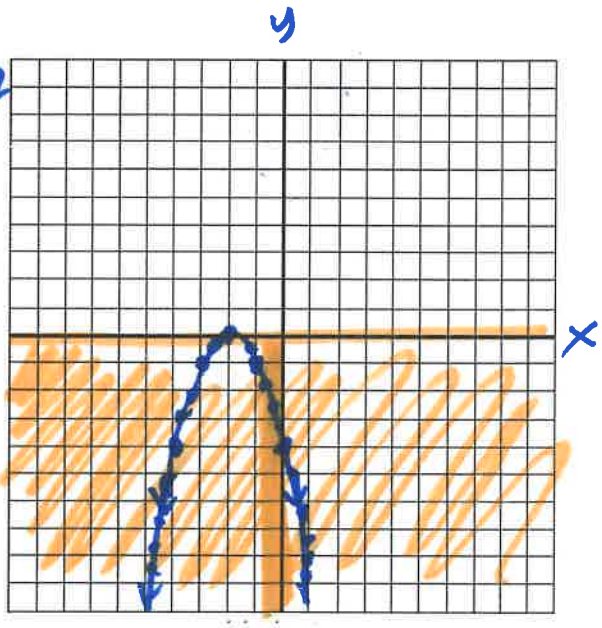
$f(x) = -1x^2 - 4x - 4$

a b c

Axis of Symmetry: $x = \frac{-b}{2a} = \frac{-(-4)}{2(-1)} = -2$

Vertex: $(-2, 0)$

| x | y | y |
|---|---|---|
| -4 | $-(-4)^2-4(-4)-4$ | -4 |
| -3 | $-(-3)^2-4(-3)-4$ | -1 |
| -2 | $-(-2)^2-4(-2)-4$ | 0 |
| -1 | $-(-1)^2-4(-1)-4$ | -1 |
| 0 | $-(0)^2-4(0)-4$ | -4 |



x-intercept(s): $(-2, 0)$

y-intercept: $(0, -4)$

Domain: all real numbers

Range: $y \leq 0$