

Fill in the blank.

When $a > 0$, the graph opens _____ and looks like

and the vertex is a _____
(maximum or minimum)

When $a < 0$, the graph opens _____ and looks like

and the vertex is a _____

Finding the Vertex

1. **Graph** the quadratic equation by typing the equation into y=.
2. Check and adjust the **window** so the graph can be seen.
3. Press the **calc** key (2nd trace).
4. Press **3: Minimum** or **4: Maximum**.
5. **Move the cursor to a position that is left** (bound) of the vertex and press enter
6. **Move the cursor to a position that is right** (bound) of the vertex and press enter
7. **Press enter for guess?**
8. **The coordinates of the vertex will be displayed on the screen.**

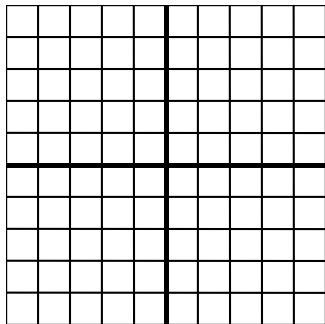
Determine if the graph opens up or down and if it will have a minimum or a maximum. Find the axis of symmetry and the vertex using the graphing calculator. Sketch the graph below.

1. $y = -3x^2 + 12x - 7$

Form:

Min or Max

Vertex:

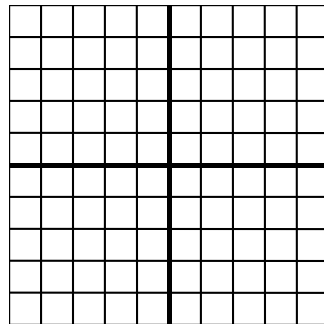


2. $y = -x(x + 3)$

Form:

Min or Max

Vertex:

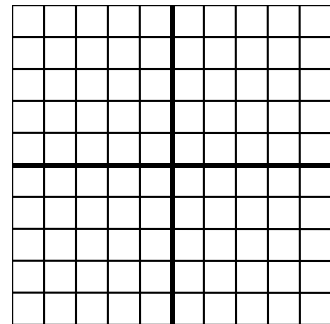


3. $y = 2(x - 2)^2 + 2$

Form:

Min or Max

Vertex:

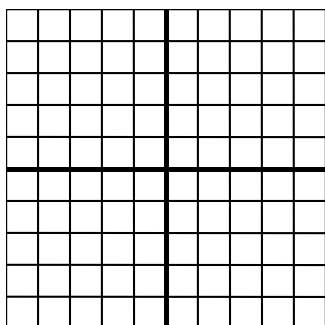


4. $y = (x + 2)(x + 3)$

Form:

Min or Max

Vertex:

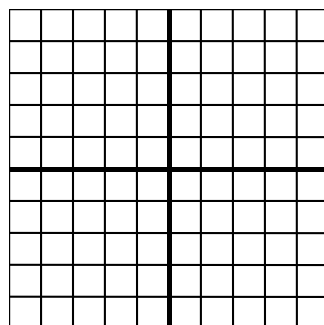


5. $y = x^2 + 3x + 2$

Form:

Min or Max

Vertex:

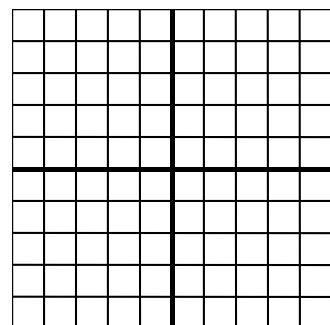


6. $y = 4(x + 1)^2 - 3$

Form:

Min or Max

Vertex:



Homework Mixed Practice Problems:

Complete without using a graphing calculator. Show your work. Determine if the Form, Vertex, and Point for each graph.

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

Form:

Vertex:

Point: (0,)

2. $y = -3x^2 + 6x - 4$

Form:

Vertex:

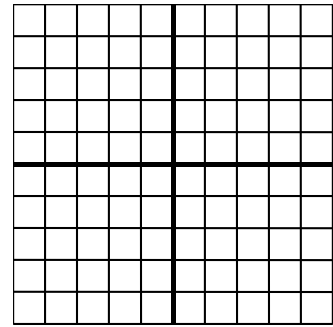
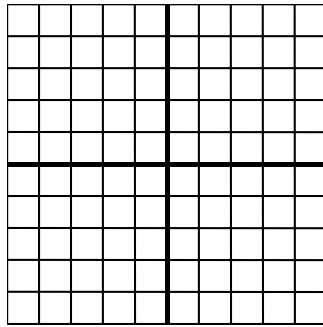
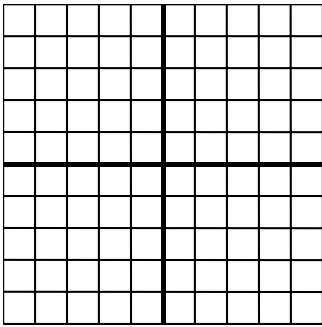
Point:

3. $y = (x + 1)(x - 3)$

Form:

Vertex:

Point:



4. $y = x^2 + 5x + 4$

Form:

Vertex:

Point:

5. $y = -2(x + 1)(x - 1)$

Form:

Vertex:

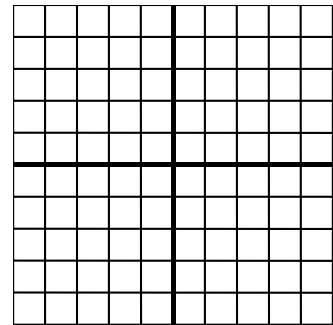
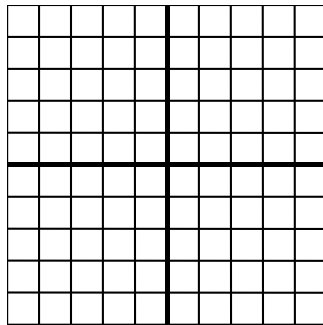
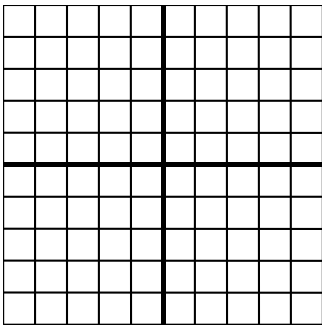
Point:

6. $y = 3(x + 1)^2 - 5$

Form:

Vertex:

Point:



Complete using a graphing calculator. Determine if the graph opens up or down, whether the vertex is a maximum or minimum and the coordinates of the vertex.

7. $y = 2(x)^2 + 3$

Min or Max

Vertex:

8. $y = -(x - 3)(x + 2)$

Min or Max

Vertex:

9. $y = -x^2 + x + 3$

Min or Max

Vertex:

