TEACHER: MADARANG
SUBJECT: ALGEBRA 1 WEEK 5 Due May 22nd
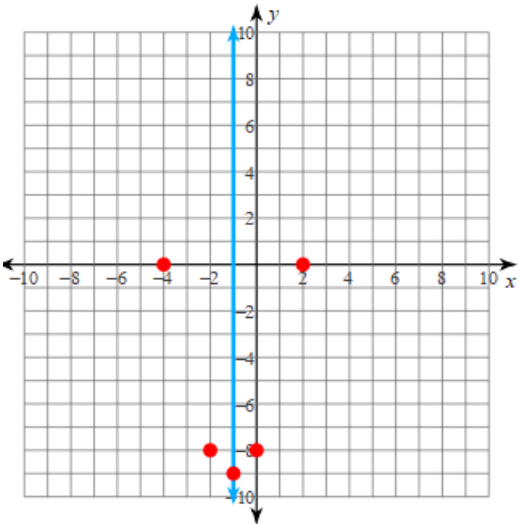

PERIOD: _____

WEEK 5: Graphing Quadratic Functions (Practice)

Let's go back to graphing quadratic functions. If you remember from last week, we had these staps in graphing quadratic functions.
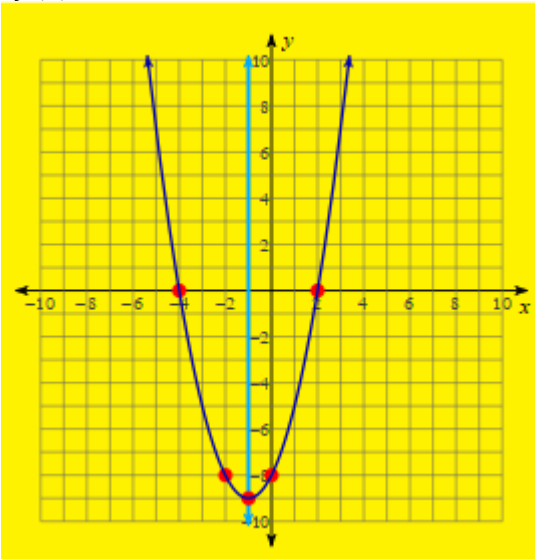
Graph the quadratic function $f(x) = x^2 + 2x - 8$	
STEP 1: Make the equation equal to zero and solve by factoring: $$x^2 + 2x - 8 = 0$$ $$(x+4)(x-2) = 0$$ $$x + 4 = 0 \quad \text{and} \quad x - 2 = 0$$ $$x = -4 \qquad\qquad x = 2$$ These will be your x-intercepts on the graph. Write them as ordered pairs (-4, 0) and (2, 0)	**STEP 2:** Get the midpoint of -4 and 2 and draw a vertical line through this point. $\frac{-4+2}{2} = \frac{-2}{2} = -1$ → your line of symmetry is $x = -1$ **STEP 3:** Substitute x = -1 into the equation to find the y-value $$f(x) = x^2 + 2x - 8$$ $$y = x^2 + 2x - 8$$ $$y = (-1)^2 + 2(-1) - 8$$ $$y = 1 - 2 - 8$$ $$y = -9$$ This becomes another point on your graph (-1, -9)
Step 4 I am going to squeeze in another step to make your graphs even more beautiful! Consider finding the y-intercept by substituting x = 0 into the equation. $$f(x) = x^2 + 2x - 8$$ $$f(x) = 0^2 + 2(0) - 8$$ $$f(x) = -8$$ This becomes another point on your graph (0, -8)	**Step 5:** Since x = 0 is one unit away (to the left) from your line of symmetry x = -1 (Step 2). We will go to the opposite side and get one unit away (to the right of x = -1. This will be x = -2. Let's now substitute x = -2 into the equation. $$f(x) = x^2 + 2x - 8$$ $$f(x) = (-2)^2 + 2(-2) - 8$$ $$f(x) = 4 - 4 - 8$$ $$f(x) = -8$$ This becomes another point on the graph (-2, -8)
STEP 6: Let us put all these points from step 1 – 5 in one table of values. <table><tr><th>X</th><th>Y</th><th>Where is this coming from?</th></tr><tr><td>-4</td><td>0</td><td>STEP 1</td></tr><tr><td>2</td><td>0</td><td></td></tr><tr><td>-1</td><td>-9</td><td>STEP 2 and 3</td></tr><tr><td>0</td><td>-8</td><td>STEP 4</td></tr><tr><td>-2</td><td>-8</td><td>STEP 5</td></tr></table> **** Also from Step 2, we have out line of symmetry $x = -1$.**	

Since we now have 5 points that belong to the quadratic function $f(x) = x^2 + 2x - 8$, let's plot all these points on the graph. Also, let's draw the line of symmetry $x = -1$.	By now, you have nothing else to do but trace the points and draw your parabola! $f(x) = x^2 + 2x - 8$

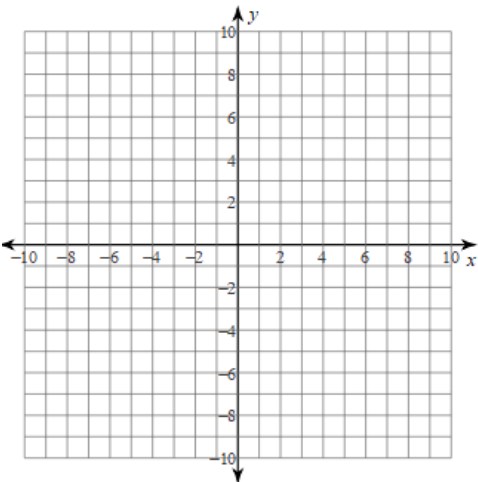**Note: This is not a U-shaped graph.   This is not a V-shaped graph.   It's a parabola!**

Graph the following quadratic functions. SHOW ALL YOUR WORK!

1. Graph: $f(x) = x^2 + 6x + 8$
WORK:

TABLE:

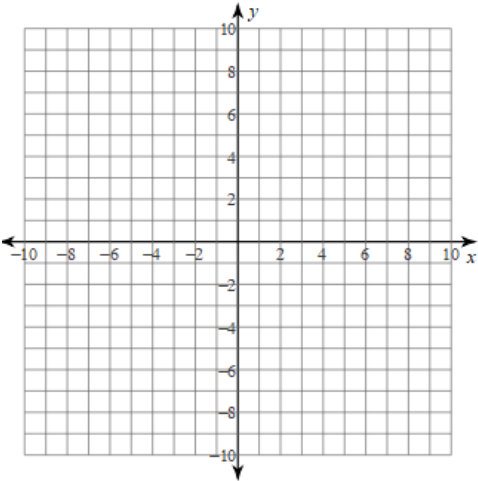| X	y

Line of symmetry: _____

2. Graph: $f(x) = x^2 + 8x - 20$
WORK:

TABLE:

X	y

Line of symmetry: _____

3. Graph: $f(x) = x^2 + 8x + 15$
WORK:

TABLE:

X	y

Line of symmetry: _____
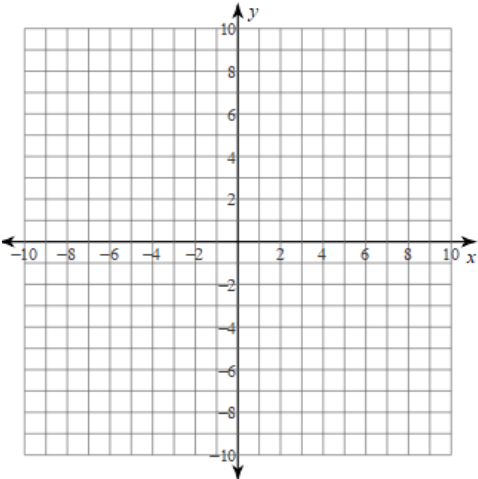
4. Graph: $f(x) = x^2 - 5x + 4$

WORK:

TABLE:

X	y

Line of symmetry: _____
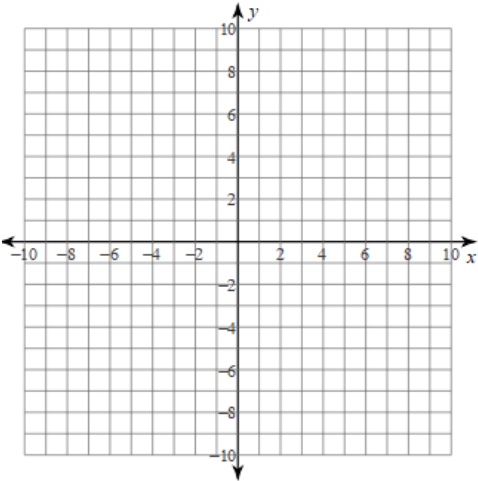
5. Graph: $f(x) = x^2 + 4x + 3$

WORK:

TABLE:

X	y

Line of symmetry: _____