

CCGPS Analytic Geometry Notes: Graphing Quadratics in Intercept Form Sept 28 2015 (Mon)
Essential Question: How do you identify characteristics of a function on a table or graph?

There are three different forms in which quadratics can be presented: yesterday, we explored the **standard form** of the quadratic function: _____ Using this form, it was not too hard to graph the parabola after identifying the vertex and using a table to find points. But, the _____ were not always easy to name. Today we are going to look at another form of the quadratic function. Identifying the x-intercepts is easier with the form called the

***Intercept Form:** _____

- If "a" is _____, the parabola opens _____. If "a" is _____, the parabola opens _____.
- The x-intercepts are the points _____ and _____. Set factors equal to 0 and solve to get p and q.
- The x-coordinate of the vertex is _____; it is half way between the x-intercepts, so find the AVERAGE of the x-intercepts. To find the y-coordinate of the vertex, substitute this value in for x in the function and solve for y.
- The axis of symmetry is the vertical line $x =$ _____; the AOS passes through the vertex.
- To graph, plot the x-intercepts, vertex, and axis of symmetry. Then connect with a smooth curve. You may want to use substitute in another value for x to get 4th and 5th point (using symmetry) for the graph.

Example 1: Find the x-intercepts of the quadratic and the x-value of vertex. Hint: you may need to factor!

a) $y = 2(x - 3)(x + 5)$

b) $y = x^2 + 5x + 6$

c) $y = 3x^2 - 12x - 15$

x-intercepts: _____

x-intercepts: _____

x-intercepts: _____

Vertex: _____

Vertex: _____

Vertex: _____

Intercept form: $a(x - p)(x - q)$

vertex x-value: $\frac{p+q}{2}$

Example 2: Graph $y = -(x + 2)(x - 4)$ Opens: _____ p: _____ q: _____

Vertex: _____ a = _____ Max / Min (Circle one)

AOS: _____ x - intercept(s): _____ y - intercept: _____

Domain: _____ Range: _____

Avg. Rate of Change $[-2, 1]$: _____

End Behavior:

As $x \rightarrow \infty, f(x) \rightarrow$ _____ Increasing: _____ Positive: _____

As $x \rightarrow -\infty, f(x) \rightarrow$ _____ Decreasing: _____ Negative: _____

Example 3: Graph $y = (x - 5)(x + 1)$ Opens: _____ p: _____ q: _____

Vertex: _____ a = _____ Max / Min (Circle one)

AOS: _____ x - intercept(s): _____ y - intercept: _____

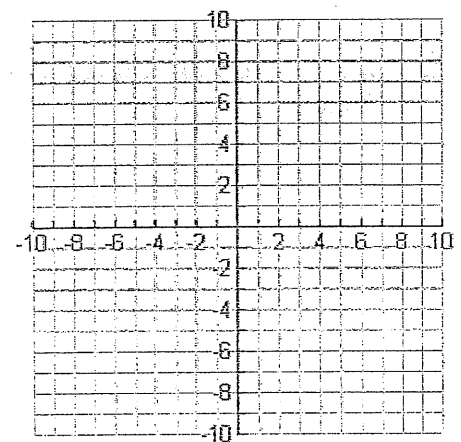
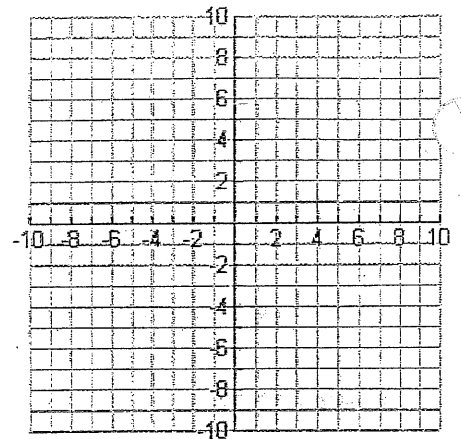
Domain: _____ Range: _____

Avg. Rate of Change $[3, 5]$: _____

End Behavior:

As $x \rightarrow \infty, f(x) \rightarrow$ _____ Increasing: _____ Positive: _____

As $x \rightarrow -\infty, f(x) \rightarrow$ _____ Decreasing: _____ Negative: _____



Homework: Graphing Quadratics in INTERCEPT Form

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Intercept form: $a(x - p)(x - q)$ vertex x-value: $\frac{p+q}{2}$

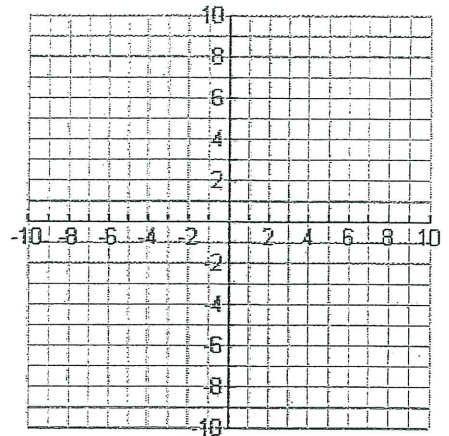
1. Graph $y = -2x(x - 4)$ Opens: _____ p: _____ q: _____

Vertex: _____ a = _____ Max / Min (Circle one)

AOS: _____ x - intercept(s): _____ y - intercept: _____

Domain: _____ Range: _____

Avg. Rate of Change [0, 2]: _____



End Behavior:

As $x \rightarrow \infty$, $f(x) \rightarrow$ _____ Increasing: _____ Positive: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ Decreasing: _____ Negative: _____

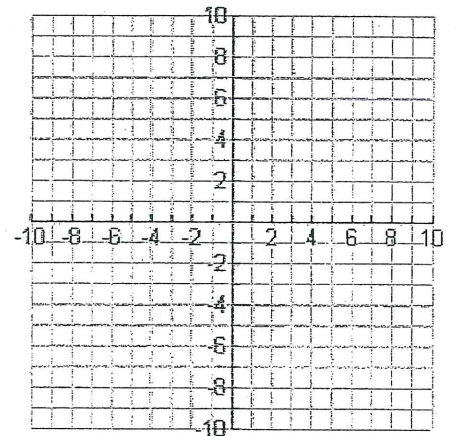
2. $y = 4(x + 1)(x - 1)$ Opens: _____ p: _____ q: _____

Vertex: _____ a = _____ Max / Min (Circle one)

AOS: _____ x - intercept(s): _____ y - intercept: _____

Domain: _____ Range: _____

Avg. Rate of Change [-1, 0]: _____



End Behavior:

As $x \rightarrow \infty$, $f(x) \rightarrow$ _____ Increasing: _____ Positive: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ Decreasing: _____ Negative: _____

3. $2(x + 3)(x + 5)$ Opens: _____ p: _____ q: _____

Vertex: _____ a = _____ Max / Min (Circle one)

AOS: _____ x - intercept(s): _____ y - intercept: _____

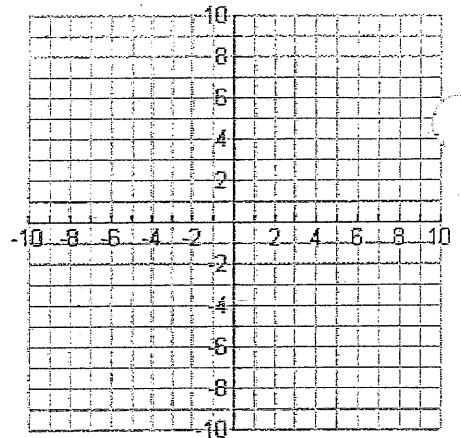
Domain: _____ Range: _____

Avg. Rate of Change $[-3, -2]$: _____

End Behavior:

As $x \rightarrow \infty, f(x) \rightarrow$ _____ Increasing: _____ Positive: _____

As $x \rightarrow -\infty, f(x) \rightarrow$ _____ Decreasing: _____ Negative: _____



4. $y = x(x - 6)$ Opens: _____ p: _____ q: _____

Vertex: _____ a = _____ Max / Min (Circle one)

AOS: _____ x - intercept(s): _____ y - intercept: _____

Domain: _____ Range: _____

Avg. Rate of Change $[3, 6]$: _____

End Behavior:

As $x \rightarrow \infty, f(x) \rightarrow$ _____ Increasing: _____ Positive: _____

As $x \rightarrow -\infty, f(x) \rightarrow$ _____ Decreasing: _____ Negative: _____

