MBF 3C: UNIT 5 – Factoring and Expanding with Quadratics
Lesson 6: Factored Form and Zeros

MBF3C
BLM 3.5.1

Name:
Date:

Exploring the Factored Form of a Parabola

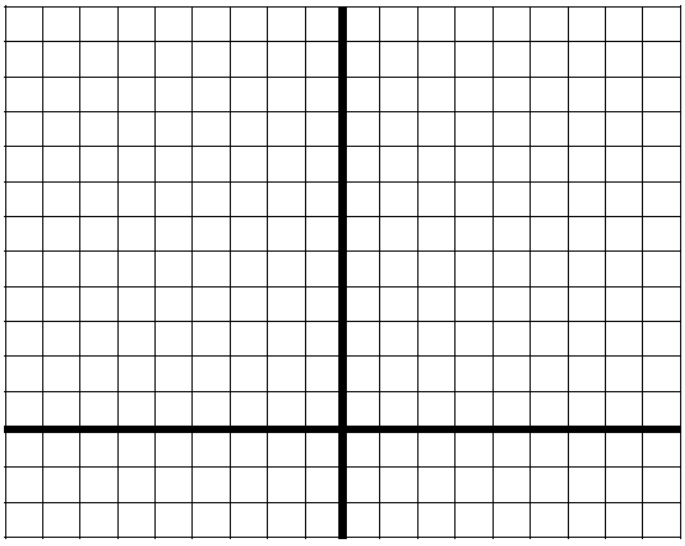
In this investigation you will graph different parabolas and determine the link between the equation in "factored form" and the zeroes of the parabola.

You will need to be able to determine the following about a parabola:
The zeroes
The direction of opening
The axis of symmetry
The step pattern

TECHNOLOGY OPTION
To help you graph and plot the parabolas, enter the equation in the [Y =] screen on your TI – 83 graphing calculator, press [graph] to see the graph and press [2nd] [graph] to see a table of values for the parabola

Parabola Investigation #1

Equation	y = (x – 1)(x + 1)
Table of Values	
x	y
-3	
-2	
-1	
0	
1	
2	
3	
Fill in the following information about the parabola:	



What is the Direction of Opening?	What are the zeroes?	What is the axis of symmetry?	What is the step pattern?
_____	_____ and _____	_____	_____, _____, _____

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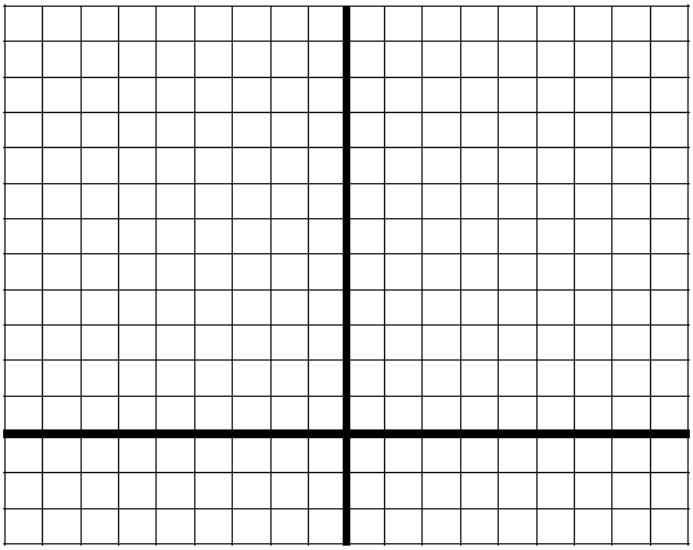
Parabola Investigation #2

Name:
Date:

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

Table of Values	
x	y
-2	
-1	
0	
1	
2	
3	
4	



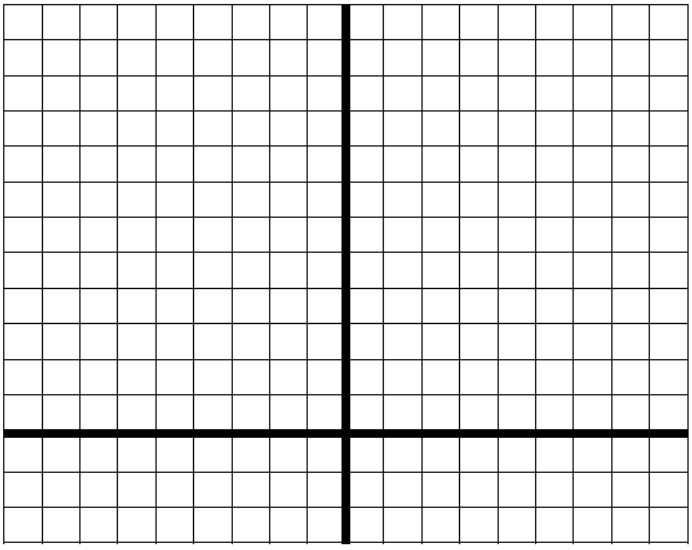
Fill in the following information about the parabola:

Direction of Opening?	What are the zeroes?	What is the axis of symmetry?	Step pattern?
_____	_____ and _____	_____	_____, _____, _____

Parabola Investigation #3

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

Table of Values	
x	y
-6	
-5	
-4	
-3	
-2	
-1	
0	



Fill in the following information about the parabola:

Direction of Opening?	What are the zeroes?	What is the axis of symmetry?	Step pattern?
_____	_____ and _____	_____	_____, _____, _____

What is the relationship between factored form and the zeroes of the parabola?

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Factored Form of a Parabola

Factored Form of a Quadratic Relation:

$$y = a(x - s)(x - t)$$

This controls the direction and opening as well as the step pattern (same as in vertex form!)

The opposites of these numbers are the zeroes of the parabola. In this case, the parabola would have zeroes of s and t. (or officially, (s, 0) and (t, 0)

Practice: Fill in the table for each parabola equation.

Equation	$y = 3(x - 3)(x + 5)$	$y = -(x + 2)(x + 6)$	$y = x(x + 8)$
Zeros			
Direction of Opening			
Axis of Symmetry			
Step Pattern			

Practice: Find the vertex of the middle parabola, and then sketch it.