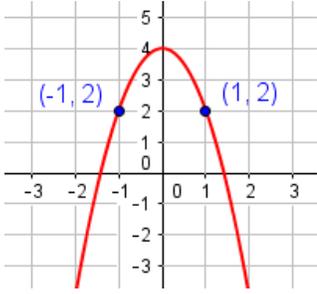
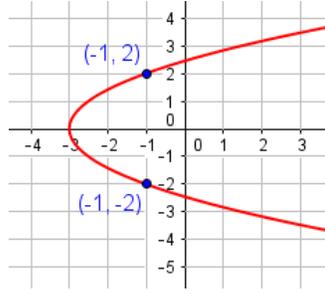
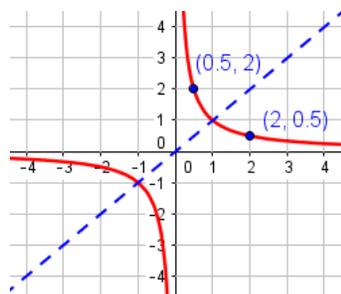
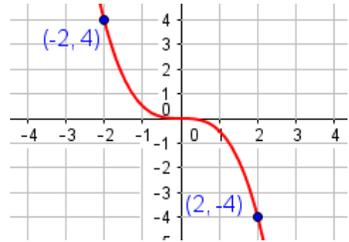


Name:

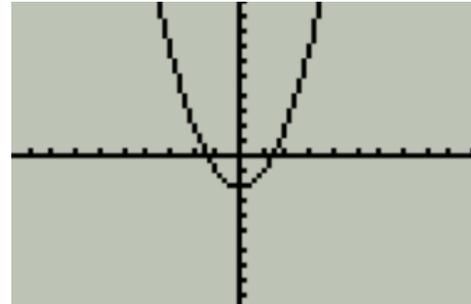
Period:

Date:

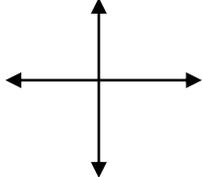
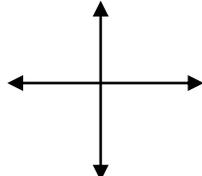
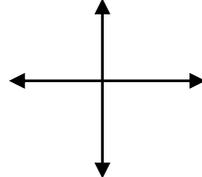
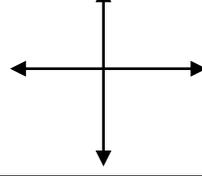
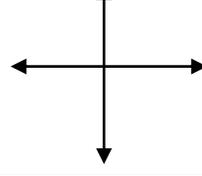
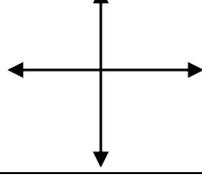
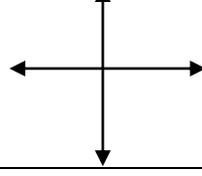
## Math Lab: Common Types of Symmetry

<p style="text-align: center;"><b>y-axis symmetry</b></p>	<p style="text-align: center;"><b>x-axis symmetry</b></p>	<p style="text-align: center;"><b>symmetry about the line <math>y = x</math></b></p>	<p style="text-align: center;"><b>Origin (rotational) symmetry</b></p>
<p>If you fold the graph along the y-axis, the sections of the graph _____ and _____ of the axis would coincide.</p>  <p>If <math>(x, y)</math> is on the graph, so is the point <math>(\quad, \quad)</math></p>	<p>If you fold the graph along the x-axis, the sections of the graph _____ and _____ of the axis would coincide.</p>  <p>If <math>(x, y)</math> is on the graph, so is the point <math>(\quad, \quad)</math></p>	<p>If you fold the graph along the line <math>y = x</math>, the sections of the graph _____ and _____ the line would coincide.</p>  <p>If <math>(x, y)</math> is on the graph, so is the point <math>(\quad, \quad)</math></p>	<p>If you rotate the graph _____ degrees, you get the same graph again. Origin symmetry is the same as reflecting a graph over the _____ and _____.</p>  <p>If <math>(x, y)</math> is on the graph, so is the point <math>(\quad, \quad)</math></p>

You can determine symmetry of a given equation using a graphing calculator by viewing the table or the graph.

<p>Determine the type of symmetry, if any, of the graph <math>y = x^2 - 2</math></p>	
<p>Viewing the table:</p> <p>Solve the equation for y on the left, if needed. Enter into Y= and press 2<sup>nd</sup> GRAPH to view the table. Check that for each point <math>(x, y)</math>, the point <math>(-x, y)</math> is also in the table.</p>  <p>For example, the point <math>(-3, 7)</math> is in the table. Verify then that the point <math>(3, 7)</math> is also in the table to conclude it has y-axis symmetry.</p>	<p>Viewing the graph:</p> <p>Solve the equation for y on the left, if needed. Enter into Y= and press ZOOM 6 to see the graph. You might need to ZOOM IN or ZOOM OUT.</p>  <p>Observe the graph and notice that it appears to have y-axis symmetry because if you fold the graph along the y-axis, the two halves meet up.</p>

Practice: Use a graphing calculator or Desmos to make a quick sketch to show the shape of the graph. Use the graph and the table of ordered pairs to determine the type of symmetry. For each type of symmetry the function has, identify a set of ordered pairs from the table that demonstrates that type of symmetry and record them in the corresponding box. Leave the other boxes empty. Some graphs will have more than one type of symmetry!

Equation	Quick Sketch	y-axis symmetry	x-axis symmetry	y = x symmetry	origin symmetry	no symmetry
1. $y = \frac{-9}{x^2+1}$						
2. $x^3 + 3 = y + x + 3x^2$						
3. $y = 3\sqrt[3]{x}$						
4. $y = x^4 - 6x^2 + 6$						
5. $y^2 + x = 4$ Hint: enter it in two parts... $y_1 = \sqrt{4-x}$ $y_2 = -\sqrt{4-x}$						
6. $y = 2\sqrt[3]{ 4x  - x^2}$						
7. $y = -x$						
8. $x^2 + y^2 = 9$ Hint: enter it in two parts... $y_1 = \sqrt{9-x^2}$ $y_2 = -\sqrt{9-x^2}$	