

# TRANSFORMATIONS

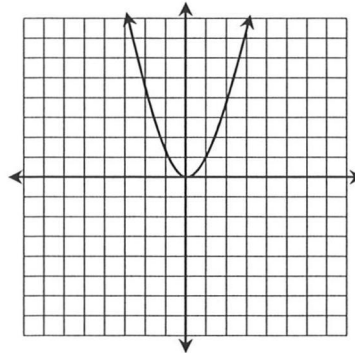
from the  
Parent Function

- The most simplistic quadratic equation is \_\_\_\_\_.
- This is known as the \_\_\_\_\_.
- A **transformation** is a \_\_\_\_\_ to the \_\_\_\_\_ or \_\_\_\_\_ of a figure.

**Directions:** Graph each function. Describe how it compares to the parent function shown on the graph.

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

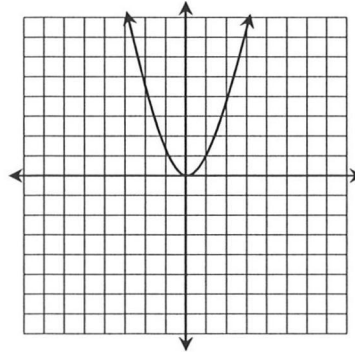
$x$	$y$



**Transformations:**

8.  $y = x^2 + 5$

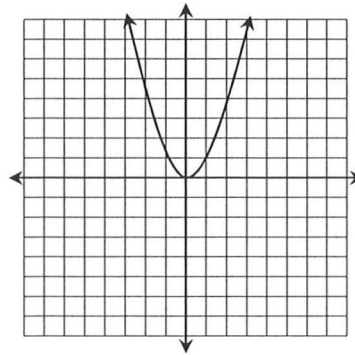
$x$	$y$



**Transformations:**

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

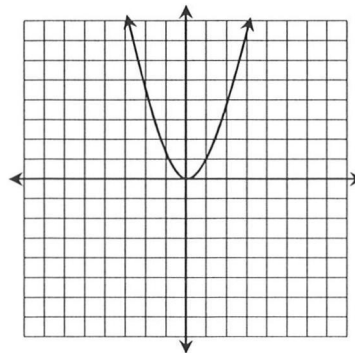
$x$	$y$



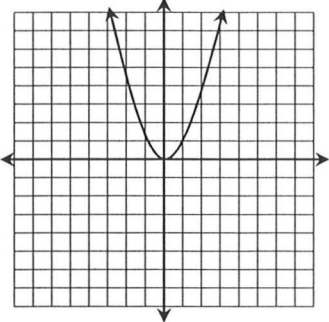
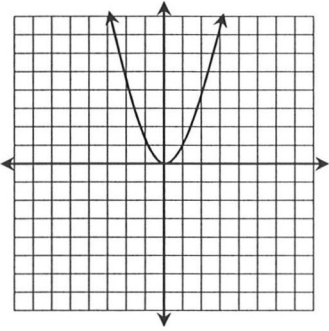
**Transformations:**

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

$x$	$y$



**Transformations:**

	<p>11. <math>y = 3x^2 - 7</math></p> <table border="1" data-bbox="594 251 758 493"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table> 	x	y											<p><b>Transformations:</b></p>
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	<p>12. <math>y = -\frac{1}{2}(x - 3)^2 - 2</math></p> <table border="1" data-bbox="594 597 758 840"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table> 	x	y											<p><b>Transformations:</b></p>
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<p><b>PUT IT TOGETHER!</b></p>	<p><b>Given a quadratic equation in vertex form, <math>y = a(x - h)^2 + k</math>:</b></p> <ul style="list-style-type: none"> <li>• <math>h</math> is the _____ shift. (+ shifts _____, - shifts _____)</li> <li>• <math>k</math> is the _____ shift. (+ shifts _____, - shifts _____)</li> <li>• If <math>a</math> is negative, the function is _____ across the ____ - _____</li> <li>• <math> a  &gt; 1</math> represents a vertical _____.</li> <li>• <math>0 &lt;  a  &lt; 1</math> represents a vertical _____.</li> </ul>													
<p><b>WRITING EQUATIONS</b></p>	<p><b>Directions:</b> Transformations from the parent function <math>y = x^2</math> are described below. Write an equation to represent the function.</p> <table border="1" data-bbox="456 1321 1459 1959"> <tbody> <tr> <td data-bbox="456 1321 963 1485">13. translated 2 units right</td> <td data-bbox="963 1321 1459 1485">14. translated 5 units up</td> </tr> <tr> <td data-bbox="456 1485 963 1649">15. translated 3 units left and 4 units down</td> <td data-bbox="963 1485 1459 1649">16. translated 7 units right and 4 units up</td> </tr> <tr> <td data-bbox="456 1649 963 1813">17. reflected over the <math>x</math>-axis, then translated 3 units down</td> <td data-bbox="963 1649 1459 1813">18. reflected over the <math>x</math>-axis, then translated 5 units right and 2 units down</td> </tr> <tr> <td data-bbox="456 1813 963 1959">19. vertically compressed by a factor of <math>1/3</math>, then translated 8 units up</td> <td data-bbox="963 1813 1459 1959">20. vertically stretched by a factor of 2, reflected over the <math>x</math>-axis, then translated 4 units left</td> </tr> </tbody> </table>		13. translated 2 units right	14. translated 5 units up	15. translated 3 units left and 4 units down	16. translated 7 units right and 4 units up	17. reflected over the $x$ -axis, then translated 3 units down	18. reflected over the $x$ -axis, then translated 5 units right and 2 units down	19. vertically compressed by a factor of $1/3$ , then translated 8 units up	20. vertically stretched by a factor of 2, reflected over the $x$ -axis, then translated 4 units left				
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