Chapter 3 Review
Partner Activity

Names: ______________________

1. Determine whether the graph of the relation is symmetric with respect to the x-axis, the y-axis, the line $y = x$, the line $y = -x$ or the origin. Then, state whether the relation is even, odd, or neither.

   The graph of the relation is symmetric with respect to ____________________________
   ________________________________

2. Determine if the equation, $y = \begin{cases} x + 2, & x \leq -2 \\ x - 2, & x \geq 2 \end{cases}$ is symmetric with respect to the x-axis, the y-axis, the line $y = x$, the line $y = -x$ or the origin. Then, state whether the relation is even, odd, or neither.

   The graph of the relation is symmetric with respect to ____________________________
   ________________________________

1. Determine whether the graph of the relation is symmetric with respect to the x-axis, the y-axis, the line $y = x$, the line $y = -x$ or the origin. Then, state whether the relation is even, odd, or neither.

   The graph of the relation is symmetric with respect to ____________________________
   ________________________________

2. Determine if the equation, $y = \begin{cases} |x| + 2 \\ -|x| - 2 \end{cases}$ is symmetric with respect to the x-axis, the y-axis, the line $y = x$, the line $y = -x$ or the origin. Then, state whether the relation is even, odd, or neither.

   The graph of the relation is symmetric with respect to ____________________________
   ________________________________
3. Complete the values in each table so the relation is symmetric with respect to the $x$-axis, the $y$-axis, or the line $y = x$. Then, state whether the relation is even, odd, or neither.

<table>
<thead>
<tr>
<th>Symmetric with respect to the $x$-axis</th>
<th>Symmetric with respect to the $y$-axis</th>
<th>Symmetric with respect to the line $y = x$</th>
<th>Symmetric with respect to the line $y = -x$</th>
<th>Symmetric with respect to the origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x$</td>
<td>$y$</td>
<td>$x$</td>
<td>$y$</td>
<td>$x$</td>
</tr>
<tr>
<td>$-3$</td>
<td>$-1$</td>
<td>$-3$</td>
<td>$-1$</td>
<td>$-3$</td>
</tr>
<tr>
<td>$-2$</td>
<td>$\frac{1}{2}$</td>
<td>$-1$</td>
<td>$\frac{1}{2}$</td>
<td>$-2$</td>
</tr>
<tr>
<td>$-1$</td>
<td>$\frac{2}{2}$</td>
<td>$-1$</td>
<td>$\frac{1}{2}$</td>
<td>$-1$</td>
</tr>
<tr>
<td>Odd, even or neither?</td>
<td>Odd, even or neither?</td>
<td>Odd, even or neither?</td>
<td>Odd, even or neither?</td>
<td>Odd, even or neither?</td>
</tr>
</tbody>
</table>

4. Solve $5 - 3|4 - 2x| = -4$.  
4. Solve $5 - 3|4 - 2x| < -4$.  

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5. Rewrite \( f(x) = 4 + 3|2 - x| \) in vertex form.

Graph the parent graph of \( f(x) = |x| \).

Graph and describe the transformation of \( f(x) = 4 + 3|2 - x| \).

The parent graph has been ____________________________
________________________________________________________________________
________________________________________________________________________

6. Rewrite \( f(x) = 4 + 3|2 - x| \) as a piecewise function. Check your equation with the graph above. Do they agree?

5. Rewrite \( f(x) = 5 - 2|3 - 4x| \) in vertex form.

Graph the parent graph of \( f(x) = |x| \).

Graph and describe the transformation of \( f(x) = 5 - 2|3 - 4x| \).

The parent graph has been ____________________________
________________________________________________________________________
________________________________________________________________________

6. Rewrite \( f(x) = 5 - 2|3 - 4x| \) as a piecewise function. Check your equation with the graph above. Do they agree?
7. Write an example of an absolute value equation or inequality that has no solution. Explain why it has no solution.

8. Graph
\[ f(x) = \begin{cases} 
(x - 3)^2 - 2 & \text{if } x > 1 \\
4x + 2 & \text{if } x \leq 1 
\end{cases} \]

8. Graph
\[ f(x) = \begin{cases} 
(x + 1)^2 + 3 & \text{if } x > 2 \\
5 - x & \text{if } x \leq 2 
\end{cases} \]

9. Find \( f(-1) \) if \( f(x) = \begin{cases} 
(x - 3)^2 - 2 & \text{if } x > 1 \\
4x + 2 & \text{if } x \leq 1 
\end{cases} \)

9. Find \( f(0) \) if \( f(x) = \begin{cases} 
(x + 1)^2 + 3 & \text{if } x > 2 \\
5 - x & \text{if } x \leq 2 
\end{cases} \)
10. Graph $|4 - 3x| < y$.

11. Without using a graphing calculator, graph $y = (3 - x)^2 + 2$. Then find and graph its inverse.

12. Find the inverse of the relation shown below.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

10. Graph $5 - (x + 1)^2 < y$.

11. Without using a graphing calculator, graph $y = -2(x + 1)^3 + 3$. Then find and graph its inverse.

12. Find the inverse of the relation shown below.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-4</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
13. Sketch the graph of the inverse of the function shown below.