Chapter 6 Section 6: Inverse Functions

Here is the parent function for a quadratic:  \( y = x^2 \)

If you were to swap x’s with y’s, you would get  \( x = y^2 \)

Then, if you solved for y:

\[ \pm \sqrt{x} = \pm \sqrt{y^2} \]

\[ \pm \sqrt{x} = \pm y \]

So the quadratic function and the square root function are inverse functions.

- Functions that undo each other are called ________________  ____________________.

How to find the inverse function: Set y equal to f(x). Switch the roles of x and y and solve for y.

Example 1: Find the inverse of \( f(x) = 2x + 8 \). Graph the function and its inverse.

Original Function: \( f(x) = 2x + 8 \)

<table>
<thead>
<tr>
<th>x</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

Inverse Function: \( f^{-1}(x) = \frac{x-8}{2} \)

<table>
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- The inverse function is denoted \( f^{-1} \), read as “______________________.”

The graph of an inverse function is a ______________ of the graph of the original function.

- The ______________  __________  _______________ is \( y = x \).
- To find the inverse of a function algebraically, switch the roles of x and y, and then solve for y.
Example 2: Find the inverse of \( f(x) = x^2 - 2, x \geq 0 \). Then graph the function and its inverse.

Is the inverse a function?

Example 3: Determine whether the inverse of \( f(x) = 2x^2 - 5 \) is a function. Then find the inverse and graph it.