Inverse Functions and Relations

Find Inverses

<table>
<thead>
<tr>
<th>Inverse Relations</th>
<th>Two relations are inverse relations if and only if whenever one relation contains the element ((a, b)), the other relation contains the element ((b, a)).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property of Inverse Functions</td>
<td>Suppose (f) and (f^{-1}) are inverse functions. Then (f(a) = b) if and only if (f^{-1}(b) = a).</td>
</tr>
</tbody>
</table>

**Example** Find the inverse of the function \(f(x) = \frac{2}{5}x - \frac{1}{5}\). Then graph the function and its inverse.

Graph the function. Find the inverse. Graph the inverse. Is the inverse a function? Why or why not?

\[ 2. y = x^2 - 3 \]
7-2 Practice

Inverse Functions and Relations

Find the inverse of each relation.

1. \{(0, 3), (4, 2), (5, -6)\}
2. \{(-5, 1), (-5, -1), (-5, 8)\}
3. \{(-3, -7), (0, -1), (5, 9), (7, 13)\}
4. \{(8, -2), (10, 5), (12, 6), (14, 7)\}
5. \{(-5, -4), (1, 2), (3, 4), (7, 8)\}
6. \{(-3, 9), (-2, 4), (0, 0), (1, 1)\}

Find the inverse of each function. Then graph the function and its inverse.

7. \(f(x) = \frac{3}{4}x\)
8. \(g(x) = 3 + x\)
9. \(y = 3x - 2\)

10. \(y = (x - 2)^2\)