Writing an Equation in Function Form (page 1)

An equation is in function form when it is solved for y. (This form will be helpful when graphing a linear equation.) For example, $2x + y = 8$ is not in function form. However, we can quickly rewrite it in function form by subtracting 2x from both sides of the equation: $y = -2x + 8$ is function form.

Examples: Write the equations in function form.

(a) $y - 2x = -3$

Solution:

<table>
<thead>
<tr>
<th>Equation</th>
<th>Action</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y - 2x = -3$</td>
<td>original equation</td>
<td>$y = 2x - 3$</td>
</tr>
<tr>
<td>$+ 2x = + 2x$</td>
<td>add 2x to each side</td>
<td></td>
</tr>
<tr>
<td>$y = 2x - 3$</td>
<td>function form</td>
<td></td>
</tr>
</tbody>
</table>

(b) $2x - y = 5$

Solution:

<table>
<thead>
<tr>
<th>Equation</th>
<th>Action</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2x - y = 5$</td>
<td>original equation</td>
<td>$y = 2x - 5$</td>
</tr>
<tr>
<td>$-2x = -2x$</td>
<td>subtract 2x from each side</td>
<td></td>
</tr>
<tr>
<td>$-y = -2x + 5$</td>
<td>multiply both sides by −1</td>
<td></td>
</tr>
<tr>
<td>$y = 2x - 5$</td>
<td>function form</td>
<td></td>
</tr>
</tbody>
</table>

Write the equations in function form. Show your work.

1. $3x + y = 4$
2. $y - 4x = 5$
3. $3x - y = 4$
Writing an Equation in Function Form (page 2)

More examples: Write the equations in function form.

(c) \(6x + 2y = -4\)  Solution:
\[
\begin{align*}
6x + 2y &= -4 \quad \text{original equation} \\
-6x &= -6x \quad \text{subtract 6x from each side} \\
2y &= -6x - 4 \\
\frac{2y}{2} &= \frac{-6x}{2} - \frac{4}{2} \quad \text{divide both sides by 2} \\
y &= -3x - 2 \quad \text{function form}
\end{align*}
\]

(d) \(2x + 3y = 15\)  Solution:
\[
\begin{align*}
2x - 3y &= 15 \quad \text{original equation} \\
-2x &= -2x \quad \text{subtract 2x from both sides} \\
-3y &= -2x + 15 \\
\frac{-3y}{-3} &= \frac{-2x}{-3} + \frac{15}{-3} \quad \text{divide both sides by -3} \\
y &= \frac{2}{3}x - 5 \quad \text{function form}
\end{align*}
\]

Write the equations in function form. Show your work.
4. \(4x + 2y = 6\)  5. \(3y - 2x = 6\)  6. \(3x - 4y = 4\)

Writing an Equation in Function Form (page 2)

More examples: Write the equations in function form.

(c) \(6x + 2y = -4\)  Solution:
\[
\begin{align*}
6x + 2y &= -4 \quad \text{original equation} \\
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2y &= -6x - 4 \\
\frac{2y}{2} &= \frac{-6x}{2} - \frac{4}{2} \quad \text{divide both sides by 2} \\
y &= -3x - 2 \quad \text{function form}
\end{align*}
\]

(d) \(2x + 3y = 15\)  Solution:
\[
\begin{align*}
2x - 3y &= 15 \quad \text{original equation} \\
-2x &= -2x \quad \text{subtract 2x from both sides} \\
-3y &= -2x + 15 \\
\frac{-3y}{-3} &= \frac{-2x}{-3} + \frac{15}{-3} \quad \text{divide both sides by -3} \\
y &= \frac{2}{3}x - 5 \quad \text{function form}
\end{align*}
\]

Write the equations in function form. Show your work.
5. \(4x + 2y = 6\)  5. \(3y - 2x = 6\)  6. \(3x - 4y = 4\)