NOTES: Solving Equations

Equality – The equals sign in an equation is like a scale: both sides, left and right, must be the same, in order for the scale to stay in balance and the equation to be true.

You always want to get the variable by itself. So you need to cancel what it’s paired up with or you can use the inverse operations to “undo” each other.

Remember: Use the INVERSE operation.... And whatever you do to one side you have to do to the other!!

(Addition): \( y + 6 = 10 \)

Isolate the variable \( y \) (get it all by itself)

\( y + 6 = 10 \)

\( y = _____ \)

Check your work (substitute \( y \) into the equation)

\( y + 6 = 10 \) ______________________

1) \( 7 + z = 13 \) \hspace{1cm} Inverse Operation _________

Check: \( 7 + z = 13 \)

2) \( p - 5 = 19 \) \hspace{1cm} Inverse Operation _________

Check: \( p - 5 = 19 \)

(Subtraction): \( p - 5 = 12 \)

Isolate the variable \( p \) (get it all by itself)

\( p - 5 = 12 \)

\( p = _____ \)

Check your work (substitute \( p \) into the equation)

\( p - 5 = 12 \) ______________________

3) \( 7 \frac{1}{4} + m = 10 \frac{1}{2} \) \hspace{1cm} Inverse Operation _________

Check: \( 7 \frac{1}{4} + m = 10 \frac{1}{2} \)

4) \( n - 5.5 = 19.02 \) \hspace{1cm} Inverse Operation _________

Check: \( n - 5.5 = 19.2 \)
(Multiplication): \(8r = 16\)

Isolate the variable \(r\) (get it all by itself)

\[8r = 16\]

\[r = \underline{______}\]

(THE “1” IS INVISIBLE)

Check your work (substitute \(r\) into the equation)

\[8r = 16\] __________________________

(Division): \(\frac{t}{3} = 12\)

Isolate the variable \(t\) (get it all by itself)

\[\frac{t}{3} = 12\]

\[t = \underline{______}\]

(THE “1” IS INVISIBLE)

Check your work (substitute \(t\) into the equation)

\[\frac{t}{3} = 12\] __________________________
Solve each equation. Check your answer by plugging it back in. Use INVERSE operations!

<table>
<thead>
<tr>
<th>Equation 1</th>
<th>Equation 2</th>
<th>Equation 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 + m = 12</td>
<td>g + 24 = 52</td>
<td>k + 13.02 = 27.6</td>
</tr>
<tr>
<td>r - 6 = 22</td>
<td>26 = 8 + v</td>
<td>n - 9 = 16</td>
</tr>
<tr>
<td>x - 8 = 24</td>
<td>27 = 3b</td>
<td>w + 7 ( \frac{1}{3} ) = 13 ( \frac{5}{6} )</td>
</tr>
<tr>
<td>25 = ( \frac{x}{5} )</td>
<td>c - 3 = 4</td>
<td>5z = 15</td>
</tr>
<tr>
<td>95 = e + 36</td>
<td>143 = n - 27</td>
<td>4 = ( \frac{a}{12} )</td>
</tr>
<tr>
<td>( \frac{t}{5} = 25 )</td>
<td>7m = 28</td>
<td>( \frac{m}{6} = 7 )</td>
</tr>
</tbody>
</table>

Select the equation that best represents each model below.

A) 3 + m = 9
B) 3 + 3m = 9
C) 3m = 9
D) 3 - m = 9

A) 3m = 7
B) 3 + 3m = 10
C) 3m + 3 = 7
D) 3 + m = 7
### Solving one-step equations: CLASSWORK: → HOMEWORK

Solve and “Check” by plugging your answer back in! Use the **Inverse** operation!

<table>
<thead>
<tr>
<th>1) ( y + 19 = 23 )</th>
<th>2) ( 5z = 15 )</th>
<th>3) ( p - 6 = 2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y = ? )</td>
<td>( z = ? )</td>
<td>( p = ? )</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>4) ( 27 = 3m )</th>
<th>5) ( \frac{m}{4} = 16 )</th>
<th>6) ( \frac{x}{6} = 42 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( m = ? )</td>
<td>( m = ? )</td>
<td>( x = ? )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7) ( \frac{p}{5} = 30 )</th>
<th>8) ( 25 = \frac{x}{5} )</th>
<th>9) ( m - 18.22 = 37.8 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( p = ? )</td>
<td>( x = ? )</td>
<td>( m = ? )</td>
</tr>
</tbody>
</table>

10) How could you solve for the variable \( m \) in this equation? \( \frac{m}{4} = 12 \)

- a) Multiply both sides of the equation by 4.
- b) Divide both sides of the equation by 4.
- c) Multiply both sides of the equation by 12.
- d) Divide both sides of the equation by 12.

11) **What method would you use to solve** \( 6 + m = 15 \)?

- a) Subtract 6 from \( 6 + m \), and subtract 6 from 15
- b) Subtract 6 from \( 6 + m \), and subtract 15 from 15
- c) Divide \( 6 + m \) by 6, and divide 15 by 15
- d) Divide \( 6 + m \) by 6, and divide 15 by 6

12) **What method would you use to solve** \( 7m = 12 \)?

- a) Multiply 7 from \( 7m \), and Multiply 7 from 12
- b) Multiply 7 from \( 7m \), and Multiply 12 from 12
- c) Divide \( 7m \) by 7, and divide 12 by 12
- d) Divide \( 7m \) by 7, and divide 12 by 7