

Solving Multi-Step Equations

At the end of the lesson I can Solve equations & check my solutions

<p>a) $4(x+1) = 2x+4$</p> <ul style="list-style-type: none"> Work $\begin{array}{r} 4x+4 = 2x+4 \\ -2x \quad -2x \\ \hline 2x+4 = 4 \\ -4 \quad -4 \\ \hline 2x = 0 \\ \frac{2}{2} \quad \frac{0}{2} \\ \hline x = 0 \end{array}$	<p>Explanations</p> <p>Distribute 4</p> <p>Subtract 2x</p> <p>subtract 4</p> <p>Divide 2</p>	<p>b) $9 - 5x + 2 = 11 - 5x$</p> <ul style="list-style-type: none"> Work $\begin{array}{r} 11 - 5x = 11 - 5x \\ +5x \quad +5x \\ \hline 11 = 11 \end{array}$ <p>Always true All solutions</p>	<p>Explanations</p> <p>Combine terms</p> <p>Add 5x</p> <p>← True statement</p>
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c) Rena says that if $x = -5$, the equation below is true. Her friend, Milo, says that the **solution** is $x = 3$. Who is correct? **Justify** your conclusions.

$9(x+4) = 1 + 2x$

Rena

$$\begin{array}{l} 9(-5+4) = 1 + 2(-5) \\ 9(-1) = 1 - 10 \\ -9 = -9 \text{ True} \end{array}$$

Milo

~~$$\begin{array}{l} 9(3+4) = 1 + 2(3) \\ 9(7) = 1 + 6 \\ 63 = 7 \\ \text{False} \end{array}$$~~

Rena is correct.

Practice! Record your work and your sequencing steps as you solve!

<p>d) $2 - (y+2) = 3y$</p> <ul style="list-style-type: none"> Work $\begin{array}{r} 2 - y - 2 = 3y \\ -y = 3y \\ +y \quad +y \\ \hline 0 = 4y \\ \frac{0}{4} \quad \frac{4}{4} \\ \hline 0 = y \end{array}$	<p>Explanations</p> <p>Distribute -</p> <p>Combine terms</p> <p>Add y</p> <p>Divide 4</p>	<p>e) $6(2x-5) = -(x+4)$</p> <ul style="list-style-type: none"> Work $\begin{array}{r} 12x - 30 = -x - 4 \\ +x \quad +x \\ \hline 13x - 30 = -4 \\ +30 \quad +30 \\ \hline 13x = 26 \\ \frac{13}{13} \quad \frac{26}{13} \\ \hline x = 2 \end{array}$	<p>Explanations</p> <p>Distribute</p> <p>Add x</p> <p>Add 30</p> <p>Divide 13</p>
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<p>f) $8a + a - 3 = 6a - 2a - 3$</p> <ul style="list-style-type: none"> Work $\begin{array}{r} 9a - 3 = 4a - 3 \\ -4a \quad -4a \\ \hline 5a - 3 = -3 \\ +3 \quad +3 \\ \hline 5a = 0 \\ \frac{5a}{5} = \frac{0}{5} \\ \hline a = 0 \end{array}$ <ul style="list-style-type: none"> Explanations Combine terms Subtract $4a$ Add 3 Divide 5 	<p>g) $8(3m - 2) - 7m = 0$</p> <ul style="list-style-type: none"> Work $\begin{array}{r} 24m - 16 - 7m = 0 \\ \hline 17m - 16 = 0 \\ +16 \quad +16 \\ \hline 17m = 16 \\ \frac{17m}{17} = \frac{16}{17} \\ \hline m = \frac{16}{17} \end{array}$ <ul style="list-style-type: none"> Explanations Distribute Combine terms Add 16 Divide 17 <p>Fractians are OK!</p>
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<p>h) $4t - 2 + 2 = 6 + 2$</p> <ul style="list-style-type: none"> Work $\begin{array}{r} 4t - 2 = 6 \\ +2 \quad +2 \\ \hline 4t = 8 \\ \frac{4t}{4} = \frac{8}{4} \\ \hline t = 2 \end{array}$ <ul style="list-style-type: none"> Explanations Subtract t^2 Add 2 Divide 4 	<p>i) $4x - 1 + 5 = 4x + 3$</p> <ul style="list-style-type: none"> Work $\begin{array}{r} -4x \quad -4x \\ -1 + 5 = 3 \\ 4 = 3 \end{array}$ <p>No solution</p> <ul style="list-style-type: none"> Explanations Subtract $4x$
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j) What did you get for a solution in part (i)? Plug in 3 different numbers of your choosing. What do you notice?

Check your understanding. Solve the following equations for x, if possible. Check your solutions!

<p>a) $-(2 - 3x) + x = 9 - x$</p> $\begin{array}{r} -2 + 3x + x = 9 - x \\ -2 + 4x = 9 - x \\ +x \quad +x \\ -2 + 5x = 9 \\ +2 \quad +2 \\ 5x = 11 \\ \frac{5x}{5} = \frac{11}{5} \\ x = \frac{11}{5} \end{array}$	<p>b) $\frac{x+2}{8} = \frac{3}{4} \cdot 8$</p> $\begin{array}{r} x + 2 = 6 \\ -2 \quad -2 \\ \hline x = 4 \end{array}$
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Rate yourself on your level of understanding:

1	2	3	4	5	6	7
I feel completely lost.			I get it.			I can do this with zero errors!