Steps in Solving Equations

Let's recall steps in solving equations.

5.1 Explaining Equivalent Expressions

Explain or show why each of these equations is equivalent to $7(x - 15) + 3 = 8$.

1. $7x - 105 + 3 = 8$

2. $7(x - 15) - 5 = 0$

3. $7x - 102 - 8 = 0$

5.2 Checking Work

Here is Clare's work to solve some equations. For each problem, do you agree or disagree with Clare's work? Explain your reasoning.

1.

$$\begin{aligned} 2(x-1)+4 &= 3x-2 \\ 2x-2+4 &= 3x-2 \\ 2x+2 &= 3x-2 \\ 2x &= 3x \\ -x &= 0 \\ x &= 0 \end{aligned}$$

2.

$$\begin{aligned} 3(x-1) &= 5x+6 \\ 3x-1 &= 5x+6 \\ -1 &= 2x+6 \\ -7 &= 2x \\ -3.5 &= x \end{aligned}$$

3.

$$\begin{aligned} (x-2)(x+3) &= x+10 \\ x^2+x-6 &= x+10 \\ x^2-6 &= 10 \\ x^2 &= 16 \\ x &= 4 \end{aligned}$$

5.3 Row Game: Rewriting Equations

Work independently on your column. Partner A completes the questions in column A only, and partner B completes the questions in column B only. Your answers in each row should match. Work on one row at a time, and check if your answer matches your partner's before moving on. If you don't get the same answer, work together to find any mistakes.

Partner A: Write an equivalent equation so that the given condition is true.	Partner B: Write an equivalent equation so that the given condition is true.
1. $5x + 10 = -35$ ◦ The expression on the right side is 0.	$5(x + 9) = 0$ ◦ The left side is expressed as the sum of two terms.
2. $x^2 - 9x = 42$ ◦ The left side is a product.	$x(x - 9) - 42 = 0$ ◦ The left side is a product, and the right side is not 0.
3. $x(x + 3) + 9 = 1$ ◦ The right side is 0.	$x(x + 3) + 6 = -2$ ◦ The right side is 0.

4. $8(x+1) = 5x$

   - The left side is 0, and there are no parentheses.

   $3x = -8$

   - The left side is 0.

5. $11 + x = \frac{12}{x}$

   - The equation is quadratic, and the right side is 0.

   $(x+12)(x-1) = 0$

   - The left side involves x^2.

6. $(3x-5)(x-2) = 0$

   - One side of the equation has a term with $3x^2$.

   $3x - 11 = \frac{10}{x}$

   - One side of the equation has a term with $3x^2$.

7. $4x^2 - 4 = 8$

   - The right side is 0, and the left side is a product.

   $4(x^2-1) = 8$

   - The right side is 0, and the left side is a product.