

Lesson 5: 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. $2(x - 1) + 4 = 3x - 2$

$$2x - 2 + 4 = 3x - 2$$

$$2x + 2 = 3x - 2$$

$$2x = 3x$$

$$-x = 0$$

$$x = 0$$

2. $3(x - 1) = 5x + 6$

$$3x - 1 = 5x + 6$$

$$-1 = 2x + 6$$

$$-7 = 2x$$

$$-3.5 = x$$

3. $(x - 2)(x + 3) = x + 10$

$$x^2 + x - 6 = x + 10$$

$$x^2 - 6 = 10$$

$$x^2 = 16$$

$$x = 4$$

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.

1. $5x + 10 = -35$

- The expression on the right side is 0

2. $x^2 - 9x = 42$

- The left side is a product

3. $x(x + 3) + 9 = 1$

- The right side is 0

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

- The left side is 0 and there are no parentheses

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

- The equation is quadratic and the right side is zero.

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

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

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

Partner B: Write an equivalent equation so that the given condition is true.

1. $5(x + 9) = 0$

- The left side is expressed as the sum of two terms

2. $x(x - 9) - 42 = 0$

- The left side is a product and the right side is not 0

3. $x(x + 3) + 6 = -2$

- The right side is 0

4. $3x = -8$

- The left side is 0

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

- The left side involves x^2

6. $3x - 11 = \frac{10}{x}$

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

7. $4(x^2 - 1) = 8$

- The right side is 0 and the left side is a product
- The right side of is 0 and the left side is a product