

Accelerated 7 • Unit 4 Worksheet

Expressions and More Equations

Name: _____

Date: _____

Part A • Equivalent Expressions

1. Are the expressions in each pair equivalent? If yes, show how to transform one into the other. If no, give a value of x that makes them differ.

a. $3(x - 2) + 4$ and $3x - 2$

b. $2x + 3x - 5$ and $5(x - 1)$

c. $-(x - 4)$ and $4 - x$

2. Factor each expression. (Find the greatest common factor first.)

a. $12x + 18 =$ _____

b. $-10x + 25 =$ _____

c. $6x^2 - 9x =$ _____

Part B • Equations with Variables on Both Sides

3. Solve each equation. Show every step.

a. $5x + 7 = 2x + 19$

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

c. $4 - 2x = 5x + 25$

Part C • One, None, or Infinite Solutions

4. For each equation, decide if it has one solution, no solution, or infinitely many. Explain.

a. $4(x + 2) = 4x + 8$

b. $3x + 5 = 3x - 2$

c. $2(x + 3) = 4x + 6$

5. Without solving, design an equation with:

a. Exactly one solution, $x = 7$:

b. No solution:

c. Infinitely many solutions:

Part D • Word Problems

6. Mai is 3 years older than her sister Lin. In 7 years, Mai will be twice as old as Lin was 4 years ago. How old is each now?

My variable choice:

Equation and solution:

Mai is _____, Lin is _____.

7. Two tanks. Tank A starts at 200 L and is draining at 8 L/min. Tank B starts at 50 L and is filling at 4 L/min. After how many minutes will they have the same amount? How much?

My equation:

Solution:

Time: _____ minutes, Amount in each: _____ L

Part E • Thinking Deeply

8. Tyler solves an equation and ends up with $0 = 5$. He says "there's no solution." Clare solves a different equation and ends up with $0 = 0$. She says "x can be anything." Are both students reasoning correctly? Explain in your own words what $0 = 5$ and $0 = 0$ each mean about the original equation.

9. Without doing any algebra, decide if the equation $7(x + 3) - 5 = 7x + 16$ has a solution, no solution, or infinitely many solutions. Justify based on STRUCTURE.

10. Andre writes $2(3x - 4) = 6x - 8$. Mai writes $2(3x - 4) = 6x - 4$. Both think their work is correct. Without solving anything, explain who is right and what error the other made.

11. Find a value of c so that the equation $3(x + c) = 3x + 12$ has infinitely many solutions. Find a value so it has no solution. Find a value so it has exactly one solution. Explain.
