Grade 7 Expressions and Equations: Simplify and Solve

Original tasks 1, 2, 3, 4 / complete keys

Task 1

Simplify 7x + 4 - 3x + 9.

Answer: 4x + 13

Reason: Combine 7x and -3x to get 4x. Combine 4 and 9 to get 13. The simplified expression is 4x + 13.

Check: Substitute x = 1: original 7 + 4 - 3 + 9 = 17; simplified 4 + 13 = 17. Equal results support correctness.

Task 2

Simplify 2(3x + 5) - 4x.

Answer: 2x + 10

Reason: Distribute 2 to get 6x + 10. Then combine 6x and -4x to get 2x. The constant 10 remains, giving 2x + 10.

Check: Substitute x = 2: original 2(6 + 5) - 8 = 22 - 8 = 14; simplified 4 + 10 = 14.

Task 3

Solve x + 9 = 15.

Answer: x = 6

Reason: Subtract 9 from both sides: x + 9 - 9 = 15 - 9, so x = 6.

Check: Substitute 6 into the original: 6 + 9 = 15, which matches the right side.

Task 4

Solve 4x - 5 = 19.

Answer: x = 6

Reason: Add 5 to both sides: 4x = 24. Divide both sides by 4: x = 6.

Check: Substitute 6: 4(6) - 5 = 24 - 5 = 19, matching the right side.

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Source rubric / reflection

- [ ] Correctly identifies and combines like terms, including signs.
- [ ] Applies the distributive property to every term inside parentheses.
- [ ] Uses inverse operations on both sides of an equation to isolate the variable.
- [ ] Shows a substitution check for equations and at least one value check for expressions.
- [ ] Presents steps in a logical order with clear equality statements.
- [ ] Accepts equivalent simplified forms, such as constant-first ordering, when mathematically correct.

Reflection: What did you check, what did you change, and what will you try next?