

Multi-Step Equations with Variables on Both Sides

Name: _____ Date: _____

LEARNING OBJECTIVE

The student will solve multi-step linear equations with variables on both sides using paper strip modeling.

MATERIALS NEEDED

- paper
- pencil
- scissors
- ruler
- 2 different colored pens or pencils

HANDS-ON ACTIVITY

1. Cut 8 paper strips of equal length. Use one color pen to write 'x' on 5 strips and a second color to write '1' (one unit) on the other 3 strips, making enough pieces to represent an equation like $3x + 2 = x + 8$.
2. Lay out 3 'x' strips plus 2 '1' strips on the left side of your desk, and 1 'x' strip plus 8 '1' strips on the right side.
3. Remove 1 'x' strip from BOTH sides (since both sides have at least one), leaving $2x + 2$ on the left and 8 on the right.
4. Remove 2 '1' strips from both sides, leaving $2x$ on the left and 6 on the right, then split the 6 into 2 equal groups to find $x = 3$.
5. Repeat the strip method on paper (drawing instead of cutting, to save time) to solve 2 more equations: $4x - 3 = 2x + 5$ and $5x + 1 = 3x + 9$.

QUESTIONS

1. Solve: $3x + 2 = x + 8$. Show each step.
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2. Solve: $4x - 3 = 2x + 5$. Show each step.
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3. Solve: $5x + 1 = 3x + 9$. Show each step.

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4. When solving an equation with variables on both sides, why is it helpful to move all variable terms to one side first?
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