Equations Inequalities and Relationships

Lesson 3 Solving Subtraction Equations

Standards 6.EE.B.7

Learning target I can solve x - p = q and check.

Materials Balance models, number lines, coordinate grids, rulers.

Lesson Flow 50 Minutes

0–5 Activate prior knowledge. Read the learning target. Ask students what they already know about solving subtraction equations. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Add p to both sides to undo subtraction. Check by subtracting p from your answer. Values in this lesson are nonnegative rational numbers. Work through the two examples on the attached instruction page. Have students name the first step before showing it.

17–22 Guided practice. Revisit worked Example 2 with its solution covered. Students propose the next step and explain why it is valid; uncover and compare with the worked solution.

22–45 Independent classwork. Assign the attached 10 questions in order. Check items 1–3 for entry-level understanding, 4–6 for connected procedures, 7–8 for representation and explanation, and 9–10 for application or justification. Ask students to use the instruction-page notes area or extra grids for longer work.

45–50 Check understanding. Use classwork question 10 as an exit discussion: Solve x - 3/2 = 0. Check in the original equation. Compare the result with the answer key and ask a student to defend the method.

Support and Extension

Support Model item 1 together with the listed tools, then have students attempt item 2 independently. Watch inverse operations, equality on both sides, open versus closed endpoints, and input/output order.

Extension Ask students to solve a final item another way, draw a second representation, or create a related problem with a checked answer.

Next step Record which students can explain the target independently. Begin the next teaching session with a brief correction for any recurring error.

Name _____ Date _____

Equations Inequalities and Relationships

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Learn and Discuss

Add p to both sides to undo subtraction. Check by subtracting p from your answer. Values in this lesson are nonnegative rational numbers.

Example 1 Solve x - 3 = 3. Check in the original equation.
Solution x = 6. Add 3 on both sides. Then x = 6; substitution gives 3 on each side.
Example 2 Solve x - 1 = 1/2. Check in the original equation.
Solution x = 3/2. Add 1 on both sides. Then x = 3/2; substitution gives 1/2 on each side.

Classwork Show Your Work

Complete the 10 problems on the following page. Refer to the examples, draw models, and check your results.

My Notes or Second Method

Lesson 3 Solving Subtraction Equations

Name _____ Show calculations, models, and units.

1. Solve x - 8 = 3/2. Check in the original equation.

2. Solve x - 8 = 1. Check in the original equation.

3. Solve x - 5 = 2. Check in the original equation.

4. Solve x - 7 = 3. Check in the original equation.

5. Solve x - 6 = 3. Check in the original equation.

6. Solve x - 5 = 5/2. Check in the original equation.

7. Solve x - 1 = 5/2. Check in the original equation.

8. Solve x - 4 = 1. Check in the original equation.

9. Solve x - 4 = 5/2. Check in the original equation.

10. Solve x - 3/2 = 0. Check in the original equation.

Solving Subtraction Equations

Equations Inequalities and Relationships

1. x = 19/2
Reasoning Add 8 on both sides. Then x = 19/2; substitution gives 3/2 on each side.

2. x = 9
Reasoning Add 8 on both sides. Then x = 9; substitution gives 1 on each side.

3. x = 7
Reasoning Add 5 on both sides. Then x = 7; substitution gives 2 on each side.

4. x = 10
Reasoning Add 7 on both sides. Then x = 10; substitution gives 3 on each side.

5. x = 9
Reasoning Add 6 on both sides. Then x = 9; substitution gives 3 on each side.

6. x = 15/2
Reasoning Add 5 on both sides. Then x = 15/2; substitution gives 5/2 on each side.

7. x = 7/2
Reasoning Add 1 on both sides. Then x = 7/2; substitution gives 5/2 on each side.

8. x = 5
Reasoning Add 4 on both sides. Then x = 5; substitution gives 1 on each side.

9. x = 13/2
Reasoning Add 4 on both sides. Then x = 13/2; substitution gives 5/2 on each side.

10. x = 3/2
Reasoning Add 3/2 on both sides. Then x = 3/2; substitution gives 0 on each side.