

Grade 7 Math – Art of Problem Solving**4.7 Solving Two-Step Inequalities**

Work in class. Show reasoning, examples, or diagrams that support your conclusions.

REASON ABOUT SOLUTIONS

1. Same solution set? Which inequalities are equivalent to $-2x + 5 \leq 11$? Explain each decision.

A. $x \geq -3$

B. $2x \geq -6$

C. $x \leq -3$

D. $-x \leq 3$

2. Two routes. Solve $-3(x - 2) > 12$ by distributing first and by dividing first. Track the direction in both routes.

3. A whole-number decision. A club has \$23 and earns \$6.50 per poster. It needs at least \$100. Find the least number of posters. Verify that one fewer does not work.

Grade 7 Math – Art of Problem Solving**4.7 Solving Two-Step Inequalities (Continued)**

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DEEPEN THE REASONING

4. The changing fee. In $5n + f \leq 60$, a fee f increases by \$5. Describe the change in the real-number boundary. Explain why the greatest whole-number count also decreases by 1 when both counts remain nonnegative.

5. Strict versus inclusive. A tank begins with 45 liters and loses 2.5 liters per minute. Compare the times for “less than 20 liters remain and “at most 20 liters remain. State the physical time restriction.

6. Same expression, different question. Compare $-4(x + 1) = 12$ and $-4(x + 1) \geq 12$. Solve each, graph the inequality, and explain how the equation solution relates to the inequality boundary.
