

Grade 7 Math – Art of Problem Solving

4.4 Writing and Graphing Inequalities

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

REASON ABOUT SOLUTIONS

1. Different words, same set? Which statements describe exactly the same solution set as $x \leq -2$? Explain each choice.

A. A number is at most -2 .

B. $-2 \geq x$.

C. A number is at least -2 .

D. $x < -2$.

2. Checking is not solving. Test $q = -3, 0, 4$ in $2q - 1 < 6$. Explain what these three tests tell you and what they do not tell you.

3. A graph with a restriction. A room holds at most 24 people. Let n be the number present. Write an inequality. Explain why a real-number ray alone does not describe all the context restrictions.

Grade 7 Math – Art of Problem Solving**4.4 Writing and Graphing Inequalities (Continued)**

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

DEEPEN THE REASONING

4. Two descriptions. One student says $x > -4$; another says $-4 < x$. Are their solution sets identical? Give a fraction that belongs and a fraction that does not.

5. Can a few points decide? Two inequalities both include 0 and exclude 5. Must their solution sets be identical? Construct a counterexample.

6. All, some, or none? A number satisfies both $x \geq -1$ and $x < 3$. Describe the values using words, then draw both graphs and mark the part they share. Is 3 included?
