Name _____ Date _____

LESSON 5.1

Challenge Practice

For use with the lesson "Solve Inequalities Using Addition and Subtraction"

In Exercises 1–4, use the following information to write a verbal description of the solution set of the inequality.

Another way of writing the solution to an inequality is to use *set-builder notation*. For example, the solution $x > 0$ in set-builder notation is $\{x \mid x > 0\}$ and is read as "the set of all x such that x is greater than 0." In set-builder notation, the first letter(s) defines the variable(s), the vertical bar means "such that," and the statement after the vertical bar is the definition of what is contained in the set. All members of the set must satisfy the definition.

1. $\{x \mid x < 1\}$

2. $\{y \mid y \geq 4\}$

3. $\{z \mid z \leq -5\}$

4. $\{m \mid m > -35\}$

In Exercises 5–12, translate the verbal statement using set-builder notation.

5. The set of all x such that x is less than or equal to 21.

6. The set of all k such that k is greater than -9.

7. The set of all v such that v is greater than or equal to 14.

8. The set of all b such that b is less than 85.

9. The set of all x and y such that x is less than 3 more than y.

10. The set of all x and y such that x is at most 2 more than y.

11. The set of all x and y such that x is at least 1 more than y.

12. The set of all x, y, and z such that z is no more than the sum of x and y.

In Exercises 13–17, solve the inequality. Write your solution using set-builder notation.

13. $3 + 2x > x + 5$

14. $ax + 2 < (a - 1)x + a$

15. $(a + 1)x + 3 > ax - 4$

16. $(a + 1)x + (a - 1)x \geq 2ax$

17. $(a + 1)x + (a - 1)x > 2ax + 1$