



1-9 Inequalities (Pages 46–49)

A mathematical sentence that contains $<$, $>$, \leq , or \geq is called an **inequality**. Inequalities, like equations, can be true, false, or open. Most situations in real life can be described using inequalities. The table below shows some common phrases and corresponding inequalities.

$<$	$>$	\leq	\geq
<ul style="list-style-type: none"> • less than • fewer than 	<ul style="list-style-type: none"> • greater than • more than • exceeds 	<ul style="list-style-type: none"> • less than or equal to • no more than • at most 	<ul style="list-style-type: none"> • greater than or equal to • no less than • at least

EXAMPLES

A State whether $2y < 12$ is true, false, or open.

$$2y < 12$$

Until the variable y is replaced by a number, this inequality is open.

B Translate the sentence 5 times a number is greater than or equal to 75, into an inequality.

Let n represent the number. Then translate the words into an inequality using the variable.

$$\underbrace{5}_{\text{five times}} \times \underbrace{n}_{\text{number}} \underbrace{\geq}_{\text{is greater than or equal to}} \underbrace{75}_{\text{75}}$$

$$5n \geq 75$$

PRACTICE

State whether each inequality is true, false, or open.

1. $3 > 7$ 2. $y \leq 8$ 3. $1 \geq 1$ 4. $2n > 18$ 5. $12 > 10$
 6. $1 < 4x$ 7. $8 > 16$ 8. $6 \leq 8$ 9. $2x > 7$ 10. $32 < 40$

State whether each inequality is true or false for the given value.

11. $18 + z < 23; z = 8$ 12. $m - 8 > 17; m = 29$ 13. $3x < 14; x = 5$
 14. $6x - 2x < 18; x = 3$ 15. $18 \geq 6m; m = 3$ 16. $j + 13 > 27; j = 7$

Algebra Translate each sentence into an inequality.

17. At least 18 people were at the party.
 18. There were less than 5 As.
 19. The crowd was made up of more than 80 people.



20. Standardized Test Practice The Super Bowl is the most viewed sports event televised every year. There are over one billion viewers every year. Write an inequality to describe this situation.

- A** $x > 1,000,000,000$ **C** $x = 1,000,000,000$
B $x < 1,000,000,000$ **D** $x \leq 1,000,000,000$

Answers: 1. F 2. O 3. T 4. O 5. T 6. O 7. F 8. T 9. O 10. T 11. F 12. T 13. F 14. T 15. T 16. F 17. $x \geq 18$ 18. $x > 5$ 19. $x < 80$ 20. A
