LESSON MAKER PRO

Inequality Situation Solver

Write, solve, graph, and interpret algebraic inequalities.

GRADE 7 · 7.PAR.3.2

7.PAR.3.2 "Construct algebraic inequalities to solve problems, leading to inequalities of the form px ± q > r, px ± q < r, px ± q ≤ r, or px ± q ≥ r, where p, q, and r are specific rational numbers..."

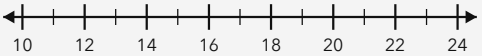
NAME _____ DATE _____

SOLVE THEN SHOW

Undo the addition or subtraction first, then undo multiplication or division. If you multiply or divide by a negative number, reverse the inequality sign. Use an open dot for < or > and a closed dot for ≤ or ≥, then shade toward the solutions.

WORKED EXAMPLE

Solve 11/6x + 13 > 46. Use the printed number line to graph the solution.



1. Subtract 13 from both sides: 11/6x > 33.
2. Multiply both sides by 6/11: x > 18.
3. Place an open dot at 18 and shade to the right.

Answer: x > 18; open dot at 18, shaded right.

PRACTICE 6 problems

1 Solve: 4x - 7 > 17

ANSWER _____

2 Solve: -2x + 8 < 16

ANSWER _____

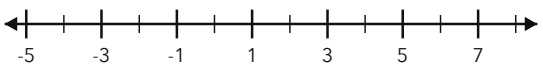
3 Solve: x/3 + 2 ≥ 7

ANSWER _____

4 Solve: 9x + 1 ≤ -17

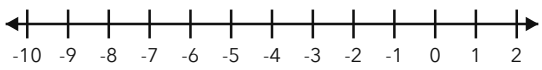
ANSWER _____

5 Solve 8x - 5 ≥ 27. Use the printed number line to graph the solution.



ANSWER _____

6 Solve -5/4x + 7 < 17. Use the printed number line to graph the solution.



ANSWER _____

APPLY IT Show your work

1 The gaming club has $45 for a tournament. It must pay a $9 entry fee and wants to buy snack cards that cost $3 each. Let x be the number of snack cards. Write and solve an inequality for the greatest number of snack cards the club can buy. Graph the solution and interpret it in this situation.

WORK SPACE

ANSWER _____

2 A student media team needs at least $58 to rent equipment. The team already has $10 and earns $4 for each car wash. Let x be the number of car washes. Write and solve an inequality for the least number of car washes needed. Graph the solution and interpret it in this situation.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A player has $40 on a game-store card. Each add-on costs $4.50, and the player wants at least $8 left on the card. Let x be the number of add-ons. Write and solve an inequality. Then explain why the inequality sign changes when you solve it, and state the possible whole-number values of x.

WORK SPACE AND ANSWER

ANSWER KEY

Inequality Situation Solver

GRADE 7 · 7.PAR.3.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve: 4x - 7 > 17	**x > 6**
2	Solve: -2x + 8 < 16	**x > -4**
3	Solve: x/3 + 2 ≥ 7	**x ≥ 15**
4	Solve: 9x + 1 ≤ -17	**x ≤ -2**
5	Solve 8x - 5 ≥ 27. Use the printed number line to graph the solution.	**x ≥ 4; closed dot at 4, shaded right.**
6	Solve -5/4x + 7 < 17. Use the printed number line to graph the solution.	**x > -8; open dot at -8, shaded right.**

PART 2 · APPLY IT

1. **3x + 9 ≤ 45; x ≤ 12. The club can buy at most 12 snack cards, where x is a whole number.** Subtract 9 to get 3x ≤ 36, then divide by 3. Graph a closed dot at 12 and shade left, using whole-number values of x.
2. **4x + 10 ≥ 58; x ≥ 12. The team needs at least 12 car washes, where x is a whole number.** Subtract 10 to get 4x ≥ 48, then divide by 4. Graph a closed dot at 12 and shade right, using whole-number values of x.

CHALLENGE

-4.5x + 40 ≥ 8; -4.5x ≥ -32; x ≤ 64/9. The sign changes because both sides are divided by -4.5. The possible whole-number values are 0, 1, 2, 3, 4, 5, 6, and 7.

Accept equivalent inequality forms and correctly graphed open or closed dots with the correct shading direction. For the context problems, accept only nonnegative whole-number solutions because cards, car washes, and add-ons cannot be fractional.