LESSON MAKER PRO

Inequality Quest

Solve, graph, and make sense of inequality situations.

GRADE 7 · 7.EE.B.4b

CCSS.Math.Content.7.EE.B.4b "Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem..."

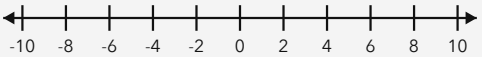
NAME _____ DATE _____

SOLVE AND SHOW

To solve an inequality, undo addition or subtraction first, then undo multiplication or division. If you multiply or divide by a negative number, reverse the inequality sign. Graph a strict inequality with an open circle, then shade or draw an arrow in the direction of the solutions.

WORKED EXAMPLE

Solve 9x - 4 > 23. Then use the printed number line to graph the solution.



1. Add 4 to both sides: 9x > 27.
2. Divide both sides by 9: x > 3.
3. Place an open circle at 3 and shade to the right.

Answer: x > 3

PRACTICE 6 problems

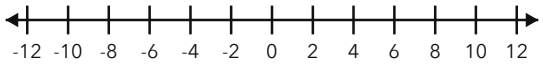
1 Solve -2x + 6 > -6. Describe how to graph the solution on a number line.

ANSWER _____

2 Solve (1/2)x - 8 < 2. Describe how to graph the solution on a number line.

ANSWER _____

3 Solve 5x + 1 > -24. Then graph the solution on the printed number line.



ANSWER _____

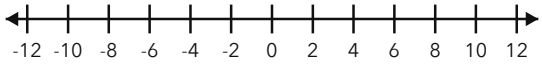
4 Solve (-1/2)x + 1 > -7. Describe how to graph the solution on a number line.

ANSWER _____

5 Solve 2x - 1 < 13. Describe how to graph the solution on a number line.

ANSWER _____

6 Solve -6x - 1 < 11. Then graph the solution on the printed number line.



ANSWER _____

APPLY IT Show your work

1 A gaming café charges a $2 membership fee plus $5 for each game session. You want to spend less than $42. Let x be the number of sessions. Write and solve an inequality. Since sessions are whole numbers, graph the possible values on the printed number line.



ANSWER _____

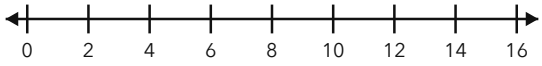
2 A museum visit costs $12 for admission plus $1.50 for each virtual reality ride. You want to spend more than $21 so you can use a gift card. Let x be the number of rides. Write and solve an inequality, then interpret the answer.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A game wallet begins with $32. Each avatar item costs $1.50. You want the money left in the wallet to be less than $14. Let x be the number of items. Write and solve an inequality. Graph the solution on the printed number line, and explain why the inequality sign changes.



WORK SPACE AND ANSWER

ANSWER KEY

Inequality Quest

GRADE 7 · 7.EE.B.4b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve -2x + 6 > -6. Describe how to graph the solution on a number line.	**x < 6; open circle at 6, shade left.**
2	Solve (1/2)x - 8 < 2. Describe how to graph the solution on a number line.	**x < 20; open circle at 20, shade left.**
3	Solve 5x + 1 > -24. Then graph the solution on the printed number line.	**x > -5; open circle at -5, shade right.**
4	Solve (-1/2)x + 1 > -7. Describe how to graph the solution on a number line.	**x < 16; open circle at 16, shade left.**
5	Solve 2x - 1 < 13. Describe how to graph the solution on a number line.	**x < 7; open circle at 7, shade left.**
6	Solve -6x - 1 < 11. Then graph the solution on the printed number line.	**x > -2; open circle at -2, shade right.**

PART 2 · APPLY IT

1. **2 + 5x < 42, so x < 8. You can play 0 through 7 sessions. Graph filled points from 0 through 7.** Subtract 2, then divide by 5 to get x < 8. Because x counts sessions, use whole-number values that are at least 0.
2. **12 + (3/2)x > 21, so x > 6. You need at least 7 rides.** Subtract 12 to get (3/2)x > 9, then multiply by 2/3. Since rides are whole numbers, the least possible number greater than 6 is 7.

CHALLENGE

32 - (3/2)x < 14, so x > 12. Graph an open circle at 12 and shade right. Since x counts items, you must buy at least 13 items. The sign changes because dividing by -3/2 reverses the inequality.

Accept equivalent inequalities and graph descriptions with an open circle and the correct shading direction. For context problems, accept the inequality solution and require the whole-number interpretation for sessions, rides, and items.