LESSON MAKER PRO

Which Values Work?

Solve inequalities and show their solutions.

GRADE 7 · 7.EE.4c

7.EE.4c "Apply the concepts of linear equations and inequalities in one variable to real-world and mathematical situations. Write and solve two-step linear inequalities. Graph the solution set on a number line and interpret its meaning."

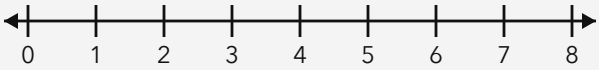
NAME _____ DATE _____

SOLVE, THEN GRAPH

Add or subtract to get the term with x by itself, then divide by its coefficient. If you divide by a negative number, reverse the inequality sign. Use an open circle for < or > and a closed circle for <= or >=, then shade toward the values that work.

WORKED EXAMPLE

Solve 11x - 19 <= 25. Graph the solution on the number line.



1. Add 19 to both sides: 11x <= 44.
2. Divide both sides by 11: x <= 4.
3. Draw a closed circle at 4 and shade left.

Answer: x <= 4; closed circle at 4, shaded left

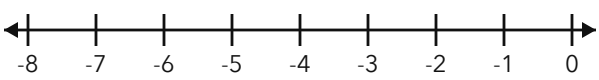
PRACTICE 6 problems

1 Solve 3x + 2 < 17. Graph the solution on the number line.



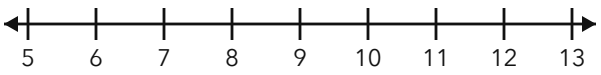
ANSWER _____

2 Solve -2x + 5 >= 13. Graph the solution on the number line.



ANSWER _____

3 Solve x/3 - 2 > 1. Graph the solution on the number line.



ANSWER _____

4 Solve 2 - 3x < -13. Graph the solution on the number line.



ANSWER _____

5 Solve 2x - 7 <= -1. Graph the solution on the number line.



ANSWER _____

6 Solve -x/2 + 3 > -2. Graph the solution on the number line.



ANSWER _____

APPLY IT Show your work

1 An arcade charges $5 to enter and $3 per game. You have at most $23. Let x be the number of games you play. Write and solve an inequality. Graph the algebraic solution on the number line, then list the possible numbers of games.



ANSWER _____

2 You have 12 points in a game and earn 5 points per level you finish. You need more than 37 points to unlock an avatar. Let x be the number of levels you finish. Write and solve an inequality. Graph the algebraic solution on the number line, then state the fewest levels you must finish.



ANSWER _____

CHALLENGE One step up

A student says -5x + 3 < -12 has the solution x < 3. Explain the mistake, write the correct solution, and graph it on the number line.



WORK SPACE AND ANSWER

ANSWER KEY

Which Values Work?

GRADE 7 · 7.EE.4c

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve 3x + 2 < 17. Graph the solution on the number line.	**x < 5; open circle at 5, shaded left**
2	Solve -2x + 5 >= 13. Graph the solution on the number line.	**x <= -4; closed circle at -4, shaded left**
3	Solve x/3 - 2 > 1. Graph the solution on the number line.	**x > 9; open circle at 9, shaded right**
4	Solve 2 - 3x < -13. Graph the solution on the number line.	**x > 5; open circle at 5, shaded right**
5	Solve 2x - 7 <= -1. Graph the solution on the number line.	**x <= 3; closed circle at 3, shaded left**
6	Solve -x/2 + 3 > -2. Graph the solution on the number line.	**x < 10; open circle at 10, shaded left**

PART 2 · APPLY IT

1. **5 + 3x <= 23; x <= 6. Closed circle at 6, shaded left. Possible numbers of games: 0, 1, 2, 3, 4, 5, or 6.** Subtract 5, then divide by 3 to get x <= 6. Since games are counted in whole numbers, only nonnegative integers through 6 fit the situation.
2. **12 + 5x > 37; x > 5. Open circle at 5, shaded right. You must finish at least 6 levels.** Subtract 12, then divide by 5 to get x > 5. The smallest whole number greater than 5 is 6.

CHALLENGE

The student did not reverse the inequality sign when dividing by -5. The solution is x > 3, shown by an open circle at 3 with shading to the right.

Accept equivalent inequality notation and graphs with the correct endpoint and shading. In the word problems, the graphed algebraic solutions include real numbers, but only nonnegative whole numbers make sense as counts of games or levels.