LESSON MAKER PRO

Inequality Pathways

Solve real-world inequalities and graph the answers.

GRADE 7 · NY-7.EE.4.b

NY-7.EE.4.b "Solve word 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 rational numbers..."

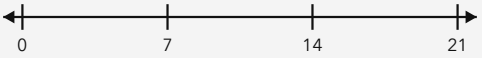
NAME _____ DATE _____

SOLVE, THEN GRAPH

Use inverse operations to get x alone. If you multiply or divide by a negative number, reverse the inequality sign. Use an open circle for < or >, and a closed circle for ≤ or ≥.

WORKED EXAMPLE

Solve 5/7x + 9 < 19. Graph the solution on the number line.

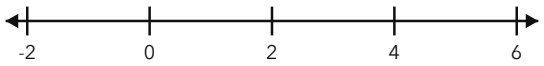


1. Subtract 9 from both sides: 5/7x < 10.
2. Multiply both sides by 7/5: x < 14.
3. Place an open circle at 14 and shade to the left.

Answer: x < 14; open circle at 14, shaded left

PRACTICE 6 problems

1 Solve -3x + 8 > -4. Graph the solution on the printed number line.



ANSWER _____

2 Solve 1/2x - 6 ≤ 2. Graph the solution on the printed number line.

ANSWER _____

3 Solve 4x + 3 < 15. Graph the solution on a number line.

ANSWER _____

4 Solve -2x - 1 ≥ 11. Graph the solution on a number line.

ANSWER _____

5 Solve 3/4x + 1 > 13. Graph the solution on a number line.

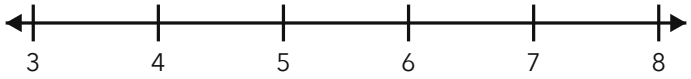
ANSWER _____

6 Solve -8/3x + 12 ≤ -4. Graph the solution on a number line.

ANSWER _____

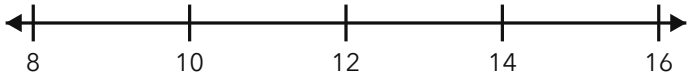
APPLY IT Show your work

1 A player starts with 6 tournament badges and earns 4 badges for each quest completed. The player needs more than 29 badges to unlock a game item. Let x be the number of quests. Write and solve an inequality. Graph the solution on the number line, then state the least whole number of quests the player needs.



ANSWER _____

2 A student can use at most 18 GB of tablet storage for a video project. Intro files use 2 GB, and each short video clip uses 4/3 GB. Let x be the number of clips. Write and solve an inequality. Graph the solution on the number line, then state the greatest whole number of clips the student can save.



ANSWER _____

CHALLENGE One step up

Jada solves -3/4x + 8 > 2 and says that x > 8. Is Jada correct? Solve the inequality, explain what happens when you divide by a negative number, and describe the correct graph.

WORK SPACE AND ANSWER

ANSWER KEY

Inequality Pathways

GRADE 7 · NY-7.EE.4.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve -3x + 8 > -4. Graph the solution on the printed number line.	**x < 4; open circle at 4, shaded left**
2	Solve 1/2x - 6 ≤ 2. Graph the solution on the printed number line.	**x ≤ 16; closed circle at 16, shaded left**
3	Solve 4x + 3 < 15. Graph the solution on a number line.	**x < 3; open circle at 3, shaded left**
4	Solve -2x - 1 ≥ 11. Graph the solution on a number line.	**x ≤ -6; closed circle at -6, shaded left**
5	Solve 3/4x + 1 > 13. Graph the solution on a number line.	**x > 16; open circle at 16, shaded right**
6	Solve -8/3x + 12 ≤ -4. Graph the solution on a number line.	**x ≥ 6; closed circle at 6, shaded right**

PART 2 · APPLY IT

1. **4x + 6 > 29, so x > 23/4. Graph an open circle at 23/4 and shade right. The player needs at least 6 whole quests.** Subtract 6 to get 4x > 23, then divide by 4. Since quests are whole numbers, the least possible value is 6.
2. **4/3x + 2 ≤ 18, so x ≤ 12. Graph a closed circle at 12 and shade left. The student can save at most 12 whole clips.** Subtract 2 to get 4/3x ≤ 16, then multiply by 3/4. A number of clips cannot be negative, so the contextual values are whole numbers from 0 through 12.

CHALLENGE

Jada is not correct. x < 8 because dividing by -3/4 reverses the inequality sign. The graph has an open circle at 8 and is shaded left.

Accept equivalent inequality forms and correct graph descriptions. For context problems, accept the algebraic solution and the stated whole-number interpretation.