LESSON MAKER PRO

Inequality Boundary Hunt

Write, solve, and graph solution sets.

HIGH SCHOOL · MA.912.AR.2.6

MA.912.AR.2.6 "Given a mathematical or real-world context, write and solve one-variable linear inequalities, including compound inequalities. Represent solutions algebraically or graphically."

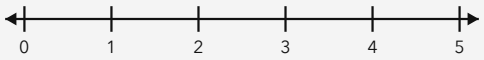
NAME _____ DATE _____

SOLVE AND SHOW

Use inverse operations to isolate x. Reverse the inequality sign only when you multiply or divide by a negative number. For a compound inequality, solve all parts and keep values that meet both conditions.

WORKED EXAMPLE

Solve 13x + 11 <= 50. Graph the solution on the number line.



1. Subtract 11: 13x <= 39.
2. Divide by 13: x <= 3.
3. Place a closed circle at 3 and shade left.

Answer: x <= 3

PRACTICE 4 problems

1 Solve: 5x - 7 >= 18

ANSWER _____

2 Solve: 10 < x + 17 <= 26

ANSWER _____

3 Solve: -(x - 12) <= -5

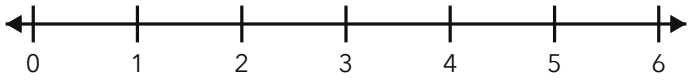
ANSWER _____

4 Solve: 11 - 6x < 35

ANSWER _____

APPLY IT Show your work

1 You have $27 in streaming credits. Each movie costs $5, and you want at least $7 left. Let x be the number of movies. Write and solve an inequality, then graph the possible whole-number values of x.



ANSWER _____

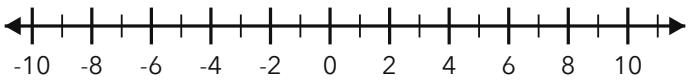
2 A student club orders shirts for an event. The printer charges a $36 setup fee plus $12 per shirt. The club can spend at most $180. Let x be the number of shirts. Write and solve an inequality.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve the compound inequality. Graph the solution on the number line. Then explain in one sentence why one endpoint is open and the other is closed: -7 < (5x + 1)/6 <= 9



WORK SPACE AND ANSWER

ANSWER KEY

Inequality Boundary Hunt

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve: 5x - 7 >= 18	**x >= 5**
2	Solve: 10 < x + 17 <= 26	**-7 < x <= 9**
3	Solve: -(x - 12) <= -5	**x >= 17**
4	Solve: 11 - 6x < 35	**x > -4**

PART 2 · APPLY IT

1. **27 - 5x >= 7; x <= 4. In context, x = 0, 1, 2, 3, or 4. Graph closed points from 0 through 4.** Subtract 27, then divide by -5 and reverse the inequality sign. Restrict the answer to nonnegative whole numbers because x counts movies.
2. **12x + 36 <= 180; x <= 12. The club can order at most 12 shirts.** Subtract 36 from both sides, then divide by 12. Shirt counts must be whole numbers.

CHALLENGE

-43/5 < x <= 53/5. Graph an open circle at -43/5, a closed circle at 53/5, and shade between them. The left endpoint is open because the inequality is <, while the right endpoint is closed because the inequality is <=.

Accept equivalent inequality forms and correct graphs with the matching open or closed endpoints. For context problems, accept only whole-number, nonnegative values when x represents a count.