LESSON MAKER PRO

Find the Boundary

Solve inequalities and show their solutions.

GRADE 7 · 7.A.3.2

7.A.3.2 "Represent, write, solve, and graph problems leading to linear inequalities with one variable in the form x + p > q and x + p < q, where p, and q are nonnegative rational numbers."

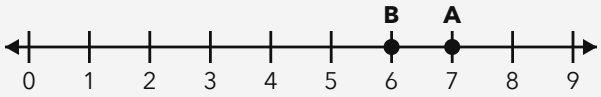
NAME _____ DATE _____

THE BIG IDEA

Subtract the same number from both sides to get x alone. Keep the inequality sign facing the same way. To graph a strict inequality, draw an open circle at the boundary and shade left for < or right for >.

WORKED EXAMPLE

On the number line, A marks q and B marks a test value. Solve x + 2/3 < q. Graph the solution and decide whether B is a solution.



1. A shows q = 7.
2. Subtract 2/3 from both sides: x < 7 - 2/3.
3. Simplify: x < 6 1/3.
4. Draw an open circle at 6 1/3 and shade left. B is at 6, so B is a solution.

Answer: x < 6 1/3; B is a solution.

PRACTICE 6 problems

1 Solve x + 3/4 > 2.

ANSWER _____

2 Solve x + 1.2 < 4.5.

ANSWER _____

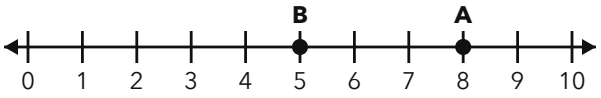
3 On the number line, A marks q and B marks a test value. Solve x + 1/4 > q. Is B a solution?



ANSWER _____

_____

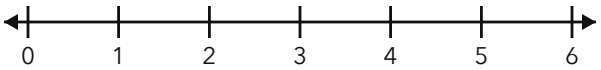
4 On the number line, A marks q and B marks a test value. Solve x + 1 1/2 < q. Is B a solution?



ANSWER _____

_____

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



ANSWER _____

_____

6 Which values from 0, 1/2, 1, and 3/2 satisfy x + 3/5 < 8/5? Write the solution inequality too.

ANSWER _____

_____

APPLY IT Show your work

1 A game update uses 1.25 GB of your data. You want to use less than 3 GB in all. Let x be the number of additional gigabytes you use. Write and solve an inequality for x.

WORK SPACE

ANSWER _____

2 Your playlist is 2.25 hours long. You want more than 4 hours of music in all. Let x be the number of hours you add. Write and solve an inequality for x.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Kai says x + 1/4 > 2 means x > 2 1/4. Correct Kai's error. Graph the correct solution on the number line and explain why the circle is open.



WORK SPACE AND ANSWER

ANSWER KEY

Find the Boundary

GRADE 7 · 7.A.3.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve x + 3/4 > 2.	**x > 1 1/4**
2	Solve x + 1.2 < 4.5.	**x < 3.3**
3	On the number line, A marks q and B marks a test value. Solve x + 1/4 > q. Is B a solution?	**x > 3 3/4; B is not a solution.**
4	On the number line, A marks q and B marks a test value. Solve x + 1 1/2 < q. Is B a solution?	**x < 6 1/2; B is a solution.**
5	Solve x + 1/2 > 3. Graph the solution on the number line.	**x > 2 1/2; open circle at 2 1/2, shaded right.**
6	Which values from 0, 1/2, 1, and 3/2 satisfy x + 3/5 < 8/5? Write the solution inequality too.	**x < 1; the values are 0 and 1/2.**

PART 2 · APPLY IT

1. **x + 1.25 < 3; x < 1.75 GB** Subtract 1.25 from both sides. In this context, x is also at least 0.
2. **x + 2.25 > 4; x > 1.75 hours** Subtract 2.25 from both sides. You must add more than 1.75 hours.

CHALLENGE

Subtract 1/4, not add it: x > 1 3/4. Draw an open circle at 1 3/4 and shade right. The circle is open because x = 1 3/4 makes the sum equal to 2, not greater than 2.

Accept equivalent fractions or decimals and equivalent descriptions of the graphs. For the data problem, students may also state 0 ≤ x < 1.75 to reflect the context.