LESSON MAKER PRO

Limits in Action

Write, solve, and graph inequalities.

GRADE 7 · 7.AT.C.9

7.AT.C.9 "Use variables to represent quantities and write and solve inequalities to model and reason about constraints and conditions in context. Write inequalities of the form px + q > r or px + q < r, where p, q..."

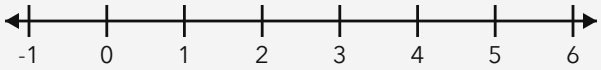
NAME _____ DATE _____

THE BIG IDEA

Let x stand for an amount that can change. Undo addition, then multiplication, to solve an inequality. Reverse the sign if you divide by a negative number. For < or >, graph an open circle at the boundary.

WORKED EXAMPLE

A ride costs $6, plus a $1 entry fee. You have less than $19 to spend. Let x be the number of rides. Write and solve an inequality. Show the solution on the number line.



1. Write: 6x + 1 < 19.
2. Subtract 1: 6x < 18.
3. Divide by 6: x < 3.
4. Graph: open circle at 3, shade left.

Answer: The possible whole numbers of rides are 0, 1, and 2.

PRACTICE 4 problems

1 Solve: 2x + 3 < 17.

ANSWER _____

2 Solve: 1/2x + 5 > 9.

ANSWER _____

3 Solve: 3/4x - 2 < 7.

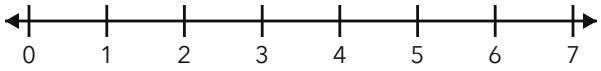
ANSWER _____

4 Solve: -2x + 5 > 13.

ANSWER _____

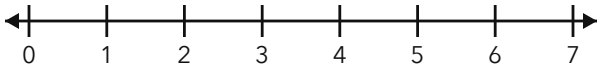
APPLY IT Show your work

1 A game app charges $2.50 to join and $1.50 per level pack. You want to spend less than $10. Let x be the number of packs. Write and solve an inequality, graph it on the number line, and list the possible whole numbers of packs.



ANSWER _____

2 A playlist has a 3-minute intro and songs that last 2.5 minutes each. It must be less than 13 minutes long. Let x be the number of songs. Write and solve an inequality, graph it on the number line, and list the possible whole numbers of songs.



ANSWER _____

CHALLENGE One step up

You have $18. Each sticker pack costs $2.50. You want more than $8 left. Let x be the number of packs. Write and solve an inequality, list the possible whole numbers of packs, and explain why the sign changes.

WORK SPACE AND ANSWER

ANSWER KEY

Limits in Action

GRADE 7 · 7.AT.C.9

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve: 2x + 3 < 17.	**x < 7**
2	Solve: 1/2x + 5 > 9.	**x > 8**
3	Solve: 3/4x - 2 < 7.	**x < 12**
4	Solve: -2x + 5 > 13.	**x < -4**

PART 2 · APPLY IT

1. **1.5x + 2.5 < 10; x < 5. Open circle at 5, shade left. Possible whole numbers of packs: 0, 1, 2, 3, 4.** Subtract 2.5, then divide by 1.5. Only nonnegative whole numbers less than 5 are possible pack counts.
2. **2.5x + 3 < 13; x < 4. Open circle at 4, shade left. Possible whole numbers of songs: 0, 1, 2, 3.** Subtract 3, then divide by 2.5. Only nonnegative whole numbers less than 4 are possible song counts.

CHALLENGE

18 - 2.5x > 8, so -2.5x > -10 and x < 4. Possible whole numbers of packs: 0, 1, 2, 3. The sign reverses when both sides are divided by -2.5.

Accept equivalent fraction or decimal coefficients. On the context graphs, accept shading left from the open circle, with nonnegative whole counts identified separately.