

Inequality Trail

Use symbols, number lines, and real situations.

GRADE 6 • 6.PFA.4

6.PFA.4 "The student will represent a contextual situation using a linear inequality in one variable with symbols and graphs on a number line. Given the graph of a linear inequality in one variable on a number line..."

NAME _____

DATE _____

READ THE BOUNDARY

An open circle means the boundary number is not included, so use $<$ or $>$. A closed circle means the boundary number is included, so use $\leq$ or $\geq$. Shading left shows values that are less, and shading right shows values that are greater.

WORKED EXAMPLE

Graph $x > 17$ on a number line.

1. The symbol $>$ means values greater than 17.
2. Because 17 is not included, draw an open circle at 17.
3. Shade to the right and add an arrow.

Answer: Open circle at 17, shaded to the right.

PRACTICE 6 problems

- 1** A number line has a closed circle at -2 and is shaded to the left. Write the inequality in two equivalent ways.

ANSWER _____

- 2** Describe the number line graph for $x > 5$.

ANSWER _____

- 3** An aquarium can hold no more than 9 fish. Let x be the number of fish. Write an inequality.

ANSWER _____

- 4** Which values in $\{2, 4, 7\}$ make $x < 4$ true?

ANSWER _____

- 5** Write one situation about library books where x is the number of books and $x \leq 8$.

ANSWER _____

- 6** Graph $x \geq 3$ on a number line.

ANSWER _____

APPLY IT Show your work

- 1** Your gaming club has 38 minutes for a meeting. Setup takes 6 minutes, and each game round takes 8 minutes. Let x be the number of game rounds. Write and solve an inequality to find the greatest whole number of rounds the club can play.

WORK SPACE

ANSWER _____

- 2** A bracelet fundraiser needs to collect at least \$55. The group already has \$19 and earns \$4 for each bracelet sold. Let x be the number of bracelets sold. Write and solve an inequality to find how many bracelets must be sold.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A number line has a closed circle at -3 and is shaded to the left. Jordan writes $x < -3$ because the shading points left. Is Jordan correct? Explain, write the inequality in two equivalent ways, and name two values in the solution set.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A number line has a closed circle at -2 and is shaded to the left. Write the inequality in two equivalent ways.	$x \leq -2$ or $-2 \geq x$
2	Describe the number line graph for $x > 5$.	Open circle at 5, shaded to the right.
3	An aquarium can hold no more than 9 fish. Let x be the number of fish. Write an inequality.	$x \leq 9$
4	Which values in $\{2, 4, 7\}$ make $x < 4$ true?	2
5	Write one situation about library books where x is the number of books and $x \leq 8$.	Sample answer: A student may check out at most 8 library books. Let x be the number of books checked out.
6	Graph $x \geq 3$ on a number line.	Closed circle at 3, shaded to the right.

PART 2 • APPLY IT

- $6 + 8x \leq 38$; $x \leq 4$; the club can play 4 whole rounds.** Subtract 6 from both sides to get $8x \leq 32$. Divide by 8, then use the greatest whole number allowed.
- $19 + 4x \geq 55$; $x \geq 9$; at least 9 bracelets must be sold.** Subtract 19 from both sides to get $4x \geq 36$. Divide by 4.

CHALLENGE

No. The shading left shows values less than -3, but the closed circle includes -3. $x \leq -3$ or $-3 \geq x$. Sample values: -3 and -5.

Accept equivalent inequality forms with the variable on either side of the symbol. For the context-writing item, accept any realistic situation that clearly means x is no more than 8.