

Inequality Quest

Solve multistep inequalities and use them in real situations.

GRADE 8 • 8.PFA.5.e

8.PFA.5.e "Solve problems in context that require the solution of a multistep linear inequality in one variable."

NAME _____

DATE _____

KEEP BOTH SIDES BALANCED

Use inverse operations to get x alone, doing the same operation to both sides. When you multiply or divide both sides by a negative number, reverse the inequality sign.

WORKED EXAMPLE

Solve: $7x - 13 \leq 29$

1. Add 13 to both sides: $7x \leq 42$.

2. Divide both sides by 7: $x \leq 6$.

Answer: $x \leq 6$

PRACTICE 6 problems

1 Solve: $4x + 9 > 25$

ANSWER _____

2 Solve: $3(x - 4) \leq 24$

ANSWER _____

3 Solve: $5 - 2x < 15$

ANSWER _____

4 Solve: $(x + 4)/3 \geq 5$

ANSWER _____

5 Solve: $-3x + 12 \geq -12$

ANSWER _____

6 Solve: $2(4x + 1) - 3 \leq 19$

ANSWER _____

APPLY IT Show your work

- 1** A streaming app charges a \$4 monthly fee plus \$3 for each movie Maya rents. She can spend no more than \$28 this month. Let x be the number of movies. How many movies can she rent?

WORK SPACE

ANSWER _____

- 2** A custom phone case costs \$58. Jalen has saved \$18 and earns \$5 for each dog-walking job. Let x be the number of jobs. How many jobs does he need to earn enough money?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve and explain why the inequality sign changes: $3 - 5x \geq 18$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $4x + 9 > 25$	$x > 4$
2	Solve: $3(x - 4) \leq 24$	$x \leq 12$
3	Solve: $5 - 2x < 15$	$x > -5$
4	Solve: $(x + 4)/3 \geq 5$	$x \geq 11$
5	Solve: $-3x + 12 \geq -12$	$x \leq 8$
6	Solve: $2(4x + 1) - 3 \leq 19$	$x \leq 5/2$

PART 2 • APPLY IT

1. $x \leq 8$, so Maya can rent at most 8 movies. Write $4 + 3x \leq 28$. Subtract 4, then divide by 3 to get $x \leq 8$.
2. $x \geq 8$, so Jalen needs at least 8 jobs. Write $18 + 5x \geq 58$. Subtract 18, then divide by 5 to get $x \geq 8$.

CHALLENGE

$x \leq -3$. After subtracting 3, divide both sides by -5, so the inequality sign reverses.

Accept equivalent inequality forms. For the word problems, accept the inequality and the matching whole-number interpretation of at most or at least.