

Balance or Bound

Solve equations and inequalities with confidence.

GRADE 7 • 7.PFA.4.h

7.PFA.4.h "Describe the differences and similarities between solving linear inequalities in one variable and linear equations in one variable."

NAME _____

DATE _____

EQUAL OR COMPARED?

Use inverse operations to isolate x in both equations and inequalities. An equation has solutions that make both sides equal. An inequality shows a range of solutions, and you must reverse the inequality sign when you multiply or divide by a negative number.

WORKED EXAMPLE

Solve: $-9x + 4 \leq 31$

1. Subtract 4 from both sides: $-9x \leq 27$
2. Divide both sides by -9 and reverse the sign: $x \geq -3$

Answer: $x \geq -3$

PRACTICE 6 problems

1 Solve: $12x + 1 = 85$

ANSWER _____

2 Solve: $x/8 - 6 = 7$

ANSWER _____

3 Solve: $-6x = 48$

ANSWER _____

4 Solve: $5x - 7 < 28$

ANSWER _____

5 Solve: $-2x + 10 \geq 22$

ANSWER _____

6 Solve: $7(x - 2) \leq 35$

ANSWER _____

APPLY IT Show your work

- 1** A gaming club charges a one-time fee of \$13 and \$5 for each tournament. You have no more than \$48 to spend. Write and solve an inequality to find how many tournaments you can enter.

WORK SPACE

ANSWER _____

- 2** Maya has saved \$72 for headphones. She saves \$8 each week, and the headphones cost \$120. Write and solve an inequality to find how many weeks she needs to save.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve: $-5(2x - 7) > 40$. Then explain why the inequality sign changes direction in your work.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $12x + 1 = 85$	$x = 7$
2	Solve: $x/8 - 6 = 7$	$x = 104$
3	Solve: $-6x = 48$	$x = -8$
4	Solve: $5x - 7 < 28$	$x < 7$
5	Solve: $-2x + 10 \geq 22$	$x \leq -6$
6	Solve: $7(x - 2) \leq 35$	$x \leq 7$

PART 2 • APPLY IT

- $13 + 5x \leq 48$; $x \leq 7$, so you can enter at most 7 tournaments.** Subtract 13 from both sides, then divide by 5. Since tournaments are whole events, 7 is the greatest possible number.
- $72 + 8x \geq 120$; $x \geq 6$, so Maya needs at least 6 weeks.** Subtract 72 from both sides, then divide by 8. She needs a total that is at least the cost of the headphones.

CHALLENGE

$x < -1/2$. After distributing and isolating the variable, you divide by a negative number. Dividing both sides by a negative reverses the order, so the inequality sign must reverse.

Accept equivalent inequality forms with the variable on either side, as long as the inequality direction is correct. For the word problems, accept the inequality and the stated whole-number conclusion.