

Inequality Switches

Solve for x and watch the sign.

GRADE 7 • 7.PFA.4.a

7.PFA.4.a "Apply properties of real numbers and the addition, subtraction, multiplication, and division properties of inequality to solve one- and two-step inequalities in one variable. Coefficients and numeric terms will be rational."

NAME _____

DATE _____

KEEP BOTH SIDES BALANCED

To isolate x, undo addition or subtraction first, then undo multiplication or division. If you multiply or divide both sides by a negative number, reverse the inequality sign.

WORKED EXAMPLE

Solve: $-13x + 21 < -70$

1. Subtract 21 from both sides: $-13x < -91$.

2. Divide both sides by -13 and reverse the sign: $x > 7$.

Answer: $x > 7$

PRACTICE 6 problems

1 Solve: $x + 6 \leq 15$

ANSWER _____

2 Solve: $x - 11 > -5$

ANSWER _____

3 Solve: $2x \geq 18$

ANSWER _____

4 Solve: $x/5 < -2$

ANSWER _____

5 Solve: $-8x \leq 16$

ANSWER _____

6 Solve: $(1/2)x + 10 \geq 14$

ANSWER _____

APPLY IT Show your work

- 1** You have 42 game tokens. You want to save 12 tokens for later. Each round of your favorite game costs 6 tokens. Write and solve an inequality for x , the number of rounds you can play.

WORK SPACE

ANSWER _____

- 2** A music subscription costs \$2 to start and \$3 each month. You can spend no more than \$20. Write and solve an inequality for x , the number of full months you can subscribe.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve: $5 - 2x > 17$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $x + 6 \leq 15$	$x \leq 9$
2	Solve: $x - 11 > -5$	$x > 6$
3	Solve: $2x \geq 18$	$x \geq 9$
4	Solve: $x/5 < -2$	$x < -10$
5	Solve: $-8x \leq 16$	$x \geq -2$
6	Solve: $(1/2)x + 10 \geq 14$	$x \geq 8$

PART 2 • APPLY IT

1. **$6x + 12 \leq 42$; $x \leq 5$** Set up $6x + 12 \leq 42$ because the game costs plus saved tokens cannot exceed 42. Subtract 12, then divide by 6 to get $x \leq 5$.
2. **$3x + 2 \leq 20$; $x \leq 6$** Set up $3x + 2 \leq 20$ because the total cost cannot be more than \$20. Subtract 2, then divide by 3 to get $x \leq 6$.

CHALLENGE

$x < -6$

Accept equivalent inequality wording, such as "x is at most 9" for $x \leq 9$. For the word problems, accept correct inequality models and whole-number interpretations of x.