LESSON MAKER PRO

Inequality Power Moves

Expand, simplify, and solve with care.

GRADE 8 · 8.PFA.5.a

8.PFA.5.a "Apply properties of real numbers and properties of inequality to solve multistep linear inequalities (up to four steps) in one variable with the variable on one or both sides of the inequality..."

NAME _____ DATE _____

KEEP BOTH SIDES BALANCED

Use the distributive property first, then combine like terms. Add or subtract the same expression on both sides, and reverse the inequality sign only when you multiply or divide by a negative number.

WORKED EXAMPLE

$7(x + 9) <= 5x + 33$

1. Distribute: 7x + 63 <= 5x + 33
2. Subtract 5x: 2x + 63 <= 33
3. Subtract 63: 2x <= -30
4. Divide by 2: x <= -15

Answer: x <= -15

PRACTICE 6 problems

1 4x - 11 > 21

ANSWER _____

2 6 - 3x <= 24

ANSWER _____

3 8(x - 1) + 14 < 4x + 18

ANSWER _____

4 1/4x + 12 >= 1/8x + 17

ANSWER _____

5 21 - 11x > 3x - 21

ANSWER _____

6 3/4(x + 16) - 10 <= 1/4x + 6

ANSWER _____

APPLY IT Show your work

1 Jay wants to buy a $44 game accessory. Jay has saved $12 and earns $4 for each dog-walking job. Let x be the number of jobs. How many jobs must Jay complete to have enough money?

WORK SPACE

ANSWER _____

2 Plan A costs $18 each month plus $3/4 per GB of data used. Plan B costs $42 each month plus $1/4 per GB of data used. Let x be the number of GB used. For what values of x is Plan A no more expensive than Plan B?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve and explain whether you reverse the inequality sign: 4(x - 12) - 6x >= 10 - 3(x + 4)

_____

_____

ANSWER KEY

Inequality Power Moves

GRADE 8 · 8.PFA.5.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	4x - 11 > 21	**x > 8**
2	6 - 3x <= 24	**x >= -6**
3	8(x - 1) + 14 < 4x + 18	**x < 3**
4	1/4x + 12 >= 1/8x + 17	**x >= 40**
5	21 - 11x > 3x - 21	**x < 3**
6	3/4(x + 16) - 10 <= 1/4x + 6	**x <= 8**

PART 2 · APPLY IT

1. **x >= 8, so Jay must complete at least 8 jobs.** Write 12 + 4x >= 44. Subtract 12, then divide by 4 to get x >= 8.
2. **0 <= x <= 48** Write 18 + 3/4x <= 42 + 1/4x. Solve to get x <= 48, then use x >= 0 because data use cannot be negative.

CHALLENGE

x >= 46. Do not reverse the inequality sign because adding or subtracting a variable expression does not reverse it. Reverse the sign only when multiplying or dividing by a negative number.

Accept equivalent solution forms for the algebra problems. For the phone-plan problem, require the nonnegative context restriction, 0 <= x <= 48.