LESSON MAKER PRO

Inequality Meaning

Solve each inequality, then tell what the solution means.

GRADE 8 · 8.PFA.5.g

8.PFA.5.g "Interpret algebraic solutions in context to linear inequalities in one variable."

NAME _____ DATE _____

SOLUTIONS TELL LIMITS

Solve an inequality as you would solve an equation. When you multiply or divide by a negative number, reverse the inequality sign. Then use the situation to decide what the solution means, such as a maximum, minimum, or possible range.

WORKED EXAMPLE

Solve 11x + 17 <= 160. Then interpret the solution if x is a number of whole items.

1. Subtract 17 from both sides: 11x <= 143.
2. Divide both sides by 11: x <= 13.
3. A whole-item amount can be 13 or fewer.

Answer: x <= 13, so you can have at most 13 items.

PRACTICE 6 problems

1 You already have 3 books checked out and may have no more than 10 books total. You check out x graphic novels. Solve x + 3 <= 10 and interpret x.

ANSWER _____

2 A game gives 2 points for each bonus round. You need more than 16 points. Solve 2x > 16, where x is the number of whole bonus rounds.

ANSWER _____

3 In a game, you earn 3 points each round but lose 6 points for a penalty. You need a score of at least 18 points. Solve 3x - 6 >= 18, where x is the number of rounds.

ANSWER _____

4 A weather model uses x for a temperature in degrees Celsius. It requires -5x <= 30. Solve and interpret x.

ANSWER _____

5 A drawing app uses x/2 + 1 megabytes of storage for x layers. The drawing must use less than 7 megabytes. Solve x/2 + 1 < 7, where x is a whole number.

ANSWER _____

6 A device has 15 percent battery charge and loses 3 percent each minute. Its charge must stay above 0 percent. Solve -3x + 15 > 0, where x is the number of whole minutes.

ANSWER _____

APPLY IT Show your work

1 You have $20 for game tokens. The arcade charges a $2 card fee and $3 per token. Let x be the number of tokens. Write and solve an inequality to find how many tokens you can buy.

WORK SPACE

ANSWER _____

2 You are saving $38 for headphones. You already have $8 and earn $6 for each pet-sitting visit. Let x be the number of visits. Write and solve an inequality to find how many visits you need.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A printing shop charges a $5 setup fee and $3 for each sticker after the first 2 stickers. For an order of at least 2 stickers, let x be the total number of stickers. You want to spend less than $20. Write and solve $3(x - 2) + 5 < 20$. What is the greatest number of stickers you can order?

_____

_____

ANSWER KEY

Inequality Meaning

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	You already have 3 books checked out and may have no more than 10 books total. You check out x graphic novels. Solve x + 3 <= 10 and interpret x.	**x <= 7, so you can check out at most 7 graphic novels.**
2	A game gives 2 points for each bonus round. You need more than 16 points. Solve 2x > 16, where x is the number of whole bonus rounds.	**x > 8, so you need at least 9 bonus rounds.**
3	In a game, you earn 3 points each round but lose 6 points for a penalty. You need a score of at least 18 points. Solve 3x - 6 >= 18, where x is the number of rounds.	**x >= 8, so you need at least 8 rounds.**
4	A weather model uses x for a temperature in degrees Celsius. It requires -5x <= 30. Solve and interpret x.	**x >= -6, so the temperature must be at least -6 degrees Celsius.**
5	A drawing app uses x/2 + 1 megabytes of storage for x layers. The drawing must use less than 7 megabytes. Solve x/2 + 1 < 7, where x is a whole number.	**x < 12, so the drawing can have at most 11 layers.**
6	A device has 15 percent battery charge and loses 3 percent each minute. Its charge must stay above 0 percent. Solve -3x + 15 > 0, where x is the number of whole minutes.	**x < 5, so the device can run for at most 4 whole minutes.**

PART 2 · APPLY IT

1. **3x + 2 <= 20; x <= 6. You can buy at most 6 tokens.** Subtract 2 from both sides to get 3x <= 18. Divide by 3, then interpret x as a whole number of tokens.
2. **6x + 8 >= 38; x >= 5. You need at least 5 pet-sitting visits.** Subtract 8 from both sides to get 6x >= 30. Divide by 6, then interpret x as a whole number of visits.

CHALLENGE

3(x - 2) + 5 < 20; x < 7. Since x is a whole number and x >= 2, you can order at most 6 stickers.

Accept equivalent inequality forms and clear context statements, such as “no more than” for a maximum or “at least” for a minimum. For countable items, students should connect the inequality to whole-number values.