LESSON MAKER PRO

Inequality Meaning

Solve the inequality, then name what the answer means.

GRADE 8 · 8.PFA.5.g

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

NAME _____ DATE _____

CONNECT X TO CONTEXT

Solve the inequality first. Then use the meaning of x and any limits in the situation, such as whole items or nonnegative amounts, to state what values make sense.

WORKED EXAMPLE

A bike rental costs $9 per hour plus a $4 fee. The total cost is more than $49. Solve 9x + 4 > 49 and interpret x.

1. Subtract 4: 9x > 45.
2. Divide by 9: x > 5.
3. x is the number of rental hours.

Answer: x > 5, so the rental lasts more than 5 hours.

PRACTICE 5 problems

1 Bracelets cost $3 each. You can spend at most $24. Solve 3x <= 24. What whole-number values can x be?

ANSWER _____

2 A club has 10 cans for a food drive. Each group adds 3 cans. The club needs at least 28 cans. Solve 10 + 3x >= 28. What does the solution mean?

ANSWER _____

3 A game session must last under 36 minutes. Each round takes 11 minutes. Solve 11x < 36. What is the greatest whole number of rounds?

ANSWER _____

4 A device starts at 31% charge. A simplified model loses 2 percentage points each hour and applies only while charge is nonnegative. For what times is charge no more than 15%? Solve 31 - 2x ≤ 15 and include the model's physical limits.

ANSWER _____

5 A school store receives a $13 opening donation and $10 for each custom order. It wants its total receipts to stay under $43. Solve $10x + 13 < 43$. What whole-number values can x be?

ANSWER _____

_____

APPLY IT Show your work

1 Mia has $52 for a tournament entry and snacks. The entry costs $16, and each snack costs $3. Write and solve an inequality for x, the number of snacks she can buy. Interpret your answer.

WORK SPACE

ANSWER

2 A phone has 128 GB of storage. You want to keep at least 20 GB free. Each video uses 6 GB. Write and solve an inequality for x, the number of videos you can save. Interpret your answer.

WORK SPACE

ANSWER

CHALLENGE One step up

A tablet has 42 GB of free storage. Each downloaded game uses 8 GB, and you must keep at least 18 GB free. Solve 42 - 8x >= 18. Explain why your answer has a lowest value as well as a highest value.

WORK SPACE AND ANSWER

ANSWER KEY

Inequality Meaning

GRADE 8 · 8.PFA.5.g

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Bracelets cost $3 each. You can spend at most $24. Solve 3x <= 24. What whole-number values can x be?	**x <= 8; x can be 0, 1, 2, 3, 4, 5, 6, 7, or 8 bracelets.**
2	A club has 10 cans for a food drive. Each group adds 3 cans. The club needs at least 28 cans. Solve 10 + 3x >= 28. What does the solution mean?	**x >= 6; at least 6 groups must add cans.**
3	A game session must last under 36 minutes. Each round takes 11 minutes. Solve 11x < 36. What is the greatest whole number of rounds?	**x < 36/11; the greatest whole number of rounds is 3.**
4	A device starts at 31% charge. A simplified model loses 2 percentage points each hour and applies only while charge is nonnegative. For what times is charge no more than 15%? Solve 31 - 2x ≤ 15 and include the model's physical limits.	**The inequality gives x ≥ 8. Nonnegative charge requires x ≤ 15.5, so the model gives 8 ≤ x ≤ 15.5 hours.**
5	A school store receives a $13 opening donation and $10 for each custom order. It wants its total receipts to stay under $43. Solve 10x + 13 < 43. What whole-number values can x be?	**x < 3; x can be 0, 1, or 2 orders.**

PART 2 · APPLY IT

1. **16 + 3x <= 52, x <= 12. Mia can buy at most 12 snacks.** Subtract 16 to get 3x <= 36. Divide by 3, then use whole-number snacks.
2. **6x + 20 <= 128, x <= 18. You can save at most 18 videos.** The videos plus the required free space cannot exceed 128 GB. Subtract 20, then divide by 6.

CHALLENGE

x <= 3, and x must be a whole number with x >= 0. The possible values are 0, 1, 2, or 3 games, because a number of games cannot be negative.

Accept equivalent inequality forms, such as 36/11 > x for problem 3. For counts of objects, accept only whole-number, nonnegative values that fit the context.