LESSON MAKER PRO

Budget Boundaries

Model limits with linear inequalities.

HIGH SCHOOL · A1.A.2.1

A1.A.2.1 "Represent relationships using mathematical models with linear inequalities; solve the resulting inequalities, graph on a coordinate plane, and interpret the solutions."

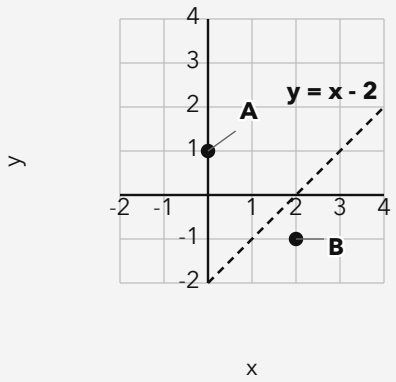
NAME _____ DATE _____

DRAW THE LIMIT

Write an inequality to show which pairs of values meet a limit. Draw a dashed boundary for < or > and a solid boundary for ≤ or ≥. Test a point to find the side to shade.

WORKED EXAMPLE

Which point on the graph satisfies y > x - 2?



1. At A, 1 > 0 - 2 is true.
2. At B, -1 > 2 - 2 is false.
3. Shade above the dashed line.

Answer: A satisfies the inequality.

PRACTICE 4 problems

1 Solve 5x - 6 ≤ 19.

ANSWER _____

2 Solve -4x + 3 > 15.

ANSWER _____

3 Does (2, 5) satisfy y < 2x + 2? Show the test.

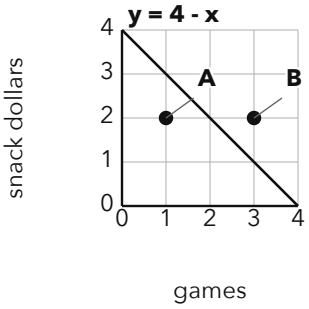
ANSWER _____

4 For y ≥ -x + 9, is the boundary solid or dashed? Which side do you shade?

ANSWER _____

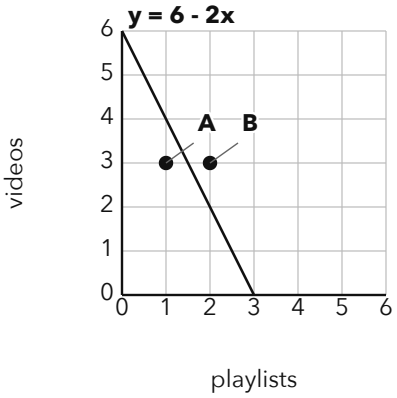
APPLY IT Show your work

1 A game pass costs $4, and each game costs $1. You have $8. On the graph, x is games and y is dollars for snacks. Write a budget inequality. Which labeled point can you afford?



ANSWER _____

2 You have 6 GB free for playlists and videos. Each playlist uses 2 GB, and each video uses 1 GB. On the graph, x is playlists and y is videos. Write a storage inequality. Which labeled plan fits?



ANSWER _____

CHALLENGE One step up

You have $18 for $2 stickers and $3 pins. Let x count stickers and y count pins. Write a budget inequality. If x = 3, what is the greatest whole-number value of y? Explain what it means.

WORK SPACE AND ANSWER

ANSWER KEY

Budget Boundaries

HIGH SCHOOL · A1.A.2.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve 5x - 6 ≤ 19.	**x ≤ 5**
2	Solve -4x + 3 > 15.	**x < -3**
3	Does (2, 5) satisfy y < 2x + 2? Show the test.	**Yes. 5 < 2(2) + 2, so 5 < 6.**
4	For y ≥ -x + 9, is the boundary solid or dashed? Which side do you shade?	**Solid boundary; shade above it.**

PART 2 · APPLY IT

1. **4 + x + y ≤ 8; point A.** At A, the total is $7. At B, the total is $9, which exceeds the budget.
2. **2x + y ≤ 6; point A.** A uses 5 GB. B uses 7 GB, which exceeds the available storage.

CHALLENGE

2x + 3y ≤ 18. With 3 stickers, 6 + 3y ≤ 18, so y ≤ 4. You can buy at most 4 pins.

Accept equivalent inequalities, including y ≤ 4 - x and y ≤ 6 - 2x for the word problems. In those contexts, counts and dollars must be nonnegative.