LESSON MAKER PRO

Points on a Line

Check which plotted points solve a linear equation.

HIGH SCHOOL · GDA.AF.C.5

GDA.AF.C.5 "Verify that the graph of a linear equation in two variables is the set of all its solutions plotted in the coordinate plane, which forms a line."

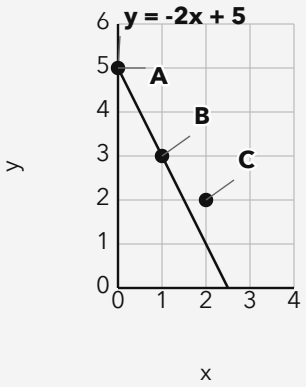
NAME _____ **DATE** _____

THE BIG IDEA

A point is on the graph of a linear equation exactly when its coordinates make the equation true. Substitute its x- and y-values to check. Every point that works lies on the same straight line.

WORKED EXAMPLE

Which plotted points are on the line y = -2x + 5?



1. A: -2(0) + 5 = 5, so A works.
2. B: -2(1) + 5 = 3, so B works.
3. C: -2(2) + 5 = 1, not 2.

Answer: A and B are on the line; C is not.

PRACTICE 4 problems

1 Does (2, 4) lie on the graph of y = 3x - 2?

ANSWER _____

2 Which point lies on 2x + y = 5: (1, 3) or (3, 0)?

ANSWER _____

3 Find the points on y = 4 - x when x = 0, 2, and 4.

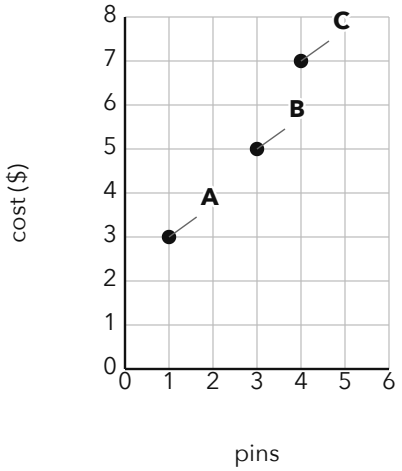
ANSWER _____

4 Do (0, 1), (2, 2), and (4, 3) all lie on y = x/2 + 1? Show one check.

ANSWER _____

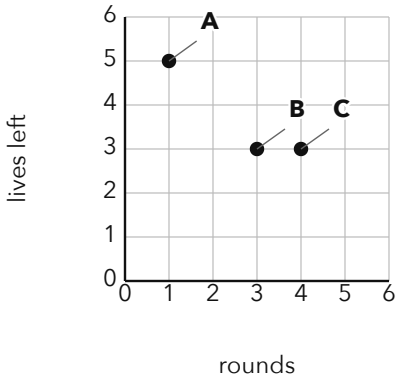
APPLY IT Show your work

1 A sticker order costs $2 to ship plus $1 per pin. Which plotted points show possible orders? Explain.



ANSWER _____

2 In a game, you start with 6 lives and lose 1 each round. Which plotted points show possible numbers of lives? Explain.



ANSWER _____

CHALLENGE One step up

Show that (0, 6), (2, 3), and (4, 0) lie on the graph of $3x + 2y = 12$. Explain why every solution of the equation lies on that same line.

WORK SPACE AND ANSWER

ANSWER KEY

Points on a Line

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Does (2, 4) lie on the graph of y = 3x - 2?	**Yes. 3(2) - 2 = 4.**
2	Which point lies on 2x + y = 5: (1, 3) or (3, 0)?	**(1, 3), because 2(1) + 3 = 5.**
3	Find the points on y = 4 - x when x = 0, 2, and 4.	**(0, 4), (2, 2), and (4, 0)**
4	Do (0, 1), (2, 2), and (4, 3) all lie on y = x/2 + 1? Show one check.	**Yes. For example, when x = 2, y = 2/2 + 1 = 2; the other two points also satisfy the equation.**

PART 2 · APPLY IT

1. **A and B. Their costs equal the number of pins plus $2; C does not.** Use y = x + 2. Points A and B satisfy it, but 4 + 2 = 6, not 7.
2. **A and B. They satisfy y = 6 - x; C does not.** After 1 and 3 rounds, 5 and 3 lives remain. After 4 rounds, 2 lives remain, not 3.

CHALLENGE

Each point makes 3x + 2y = 12 true: 0 + 12 = 12, 6 + 6 = 12, and 12 + 0 = 12. Rearranging gives y = -3x/2 + 6. Every solution satisfies this linear rule, so every solution plots on its line.

Accept any correct substitution as a check. For the challenge, accept an equivalent argument using the slope between the given points and the rearranged equation.