LESSON MAKER PRO

Lines Tell Stories

Find slope and intercepts, then explain what they mean.

GRADE 8 · PA.A.2.3

PA.A.2.3 "Identify graphical properties of linear functions, including slope and intercepts. Know that the slope equals the rate of change and that the y-intercept is zero when the function represents a proportional relationship."

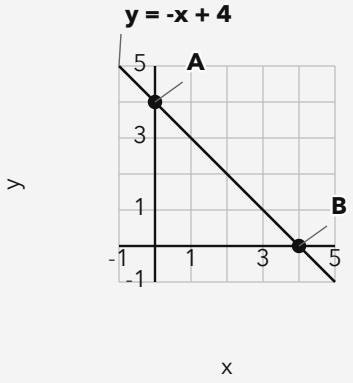
NAME _____ DATE _____

READ THE LINE

Slope is the change in y divided by the change in x between two points. The y-intercept is where a line crosses the y-axis, and the x-intercept is where it crosses the x-axis. A linear relationship is proportional when its y-intercept is 0.

WORKED EXAMPLE

Find the slope and both intercepts of the line. Is the relationship proportional?



1. At A, x = 0, so the y-intercept is 4.
2. At B, y = 0, so the x-intercept is 4.
3. Slope = (0 - 4)/(4 - 0) = -1.
4. The y-intercept is not 0, so the relationship is not proportional.

Answer: Slope: -1; x-intercept: 4; y-intercept: 4; not proportional.

PRACTICE 4 problems

1 For y = 3x, find the slope and y-intercept. Is the relationship proportional?

ANSWER _____

2 A line passes through (0, 5) and (2, 1). Find its slope and y-intercept.

ANSWER _____

3 For y = x/2 - 3, find the x-intercept and y-intercept.

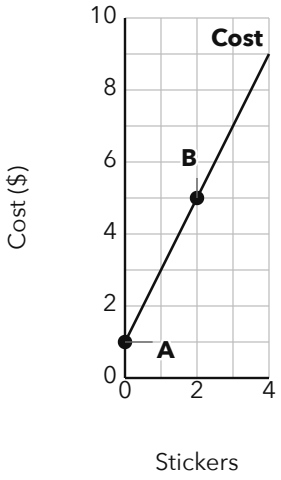
ANSWER _____

4 A line passes through (0, 2) and (5, 2). Find its slope and x-intercept.

ANSWER _____

APPLY IT Show your work

1 The graph shows the total cost of custom stickers. What is the cost per sticker? What is the starting fee?



ANSWER _____

2 A video upload reaches 15 MB after 3 minutes and 30 MB after 6 minutes. Find the upload rate and starting amount. Is the relationship proportional?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A line crosses the axes at (0, 6) and (2, 0). Find its slope. Is the relationship proportional? Explain using the y-intercept.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 3x, find the slope and y-intercept. Is the relationship proportional?	**Slope: 3; y-intercept: 0; yes, proportional.**
2	A line passes through (0, 5) and (2, 1). Find its slope and y-intercept.	**Slope: -2; y-intercept: 5.**
3	For y = x/2 - 3, find the x-intercept and y-intercept.	**x-intercept: 6; y-intercept: -3.**
4	A line passes through (0, 2) and (5, 2). Find its slope and x-intercept.	**Slope: 0; no x-intercept.**

PART 2 · APPLY IT

1. **$2 per sticker; $1 starting fee.** The slope is (5 - 1)/(2 - 0) = 2 dollars per sticker. The y-intercept is 1 dollar.
2. **5 MB per minute; 0 MB at the start; yes, proportional.** The rate is (30 - 15)/(6 - 3) = 5 MB per minute. At 3 minutes, 15 - 5(3) = 0 MB, so the relationship is proportional.

CHALLENGE

The slope is (0 - 6)/(2 - 0) = -3. It is not proportional because its y-intercept is 6, not 0.

Accept intercepts as values or points on the axes. In problem 4, the horizontal line never crosses the x-axis.