LESSON MAKER PRO

Lines Tell Stories

Find slope and intercepts, then explain what they mean.

HIGH SCHOOL · A1.A.4.1

A1.A.4.1 "Analyze, use, and apply mathematical models and other data sets (e.g., graphs, equations, two points, a set of data points) to calculate and interpret slope and the x- and y-intercepts of a line."

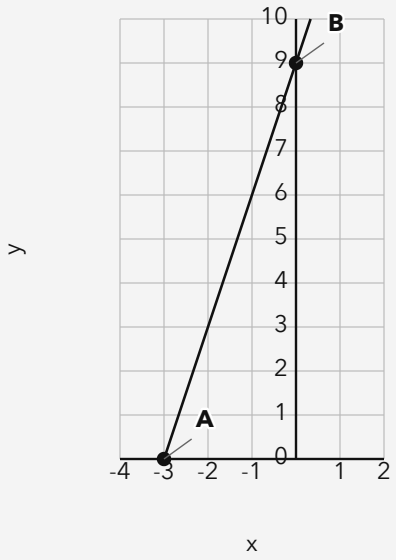
NAME _____ DATE _____

READ THE LINE

Slope is the change in y divided by the change in x. The x-intercept is where y = 0, and the y-intercept is where x = 0. In a real situation, use the units to explain what each value means.

WORKED EXAMPLE

Use the graphed line to find its slope and both intercepts.

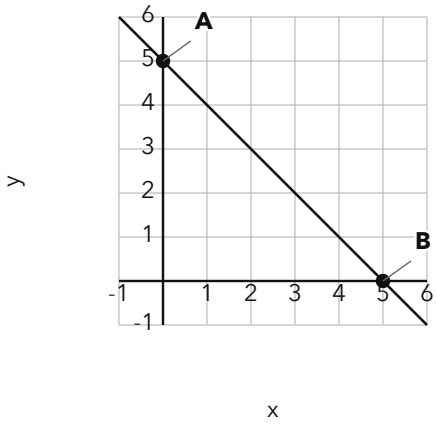


1. Read the points where the line crosses the axes: A = (-3, 0) and B = (0, 9).
2. Slope = (9 - 0)/(0 - (-3)) = 3.
3. At A, y = 0, so the x-intercept is -3. At B, x = 0, so the y-intercept is 9.

Answer: Slope = 3; x-intercept = -3; y-intercept = 9.

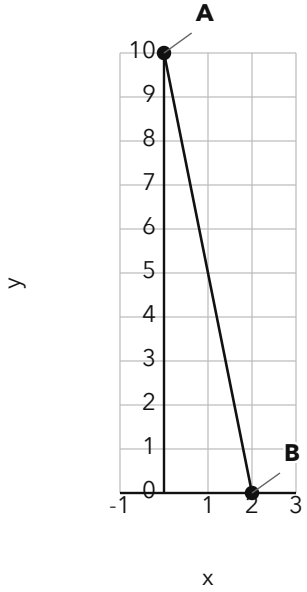
PRACTICE 6 problems

1 Use the graphed line to find its slope and x-intercept.



ANSWER _____

2 Use the graphed line to find its slope and y-intercept.



ANSWER _____

3 A line passes through (1, 6) and (5, -2). Find its slope and y-intercept.

ANSWER _____

4 For y = (1/2)x - 5, find the slope and x-intercept.

ANSWER _____

5 Use the table to find the line's slope and y-intercept.

POINTS ON A LINE

x	y
-1	-6
0	-1
1	4

ANSWER _____

6 For -7x + 5y = 35, find the slope and x-intercept.

ANSWER _____

APPLY IT Show your work

1 You have $14 saved and earn $6 for each dog-walking shift. Let x be the number of shifts and y be your total savings in dollars. Write a linear equation. Find and interpret its slope and y-intercept.

WORK SPACE

ANSWER _____

2 Your phone starts at 80% battery. During a gaming session, it loses 10 percentage points of battery each hour. Let x be the hours played and y be the battery percentage. Write a linear equation. Find and interpret its slope and x-intercept.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student club models its profit from selling tickets with $P = 7x - 35$, where x is the number of tickets sold and P is profit in dollars. Explain what the slope, x-intercept, and y-intercept mean. A club member says the y-intercept means the club sold -35 tickets. Explain the mistake.

WORK SPACE AND ANSWER

ANSWER KEY

Lines Tell Stories

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the graphed line to find its slope and x-intercept.	**Slope = -1; x-intercept = 5.**
2	Use the graphed line to find its slope and y-intercept.	**Slope = -5; y-intercept = 10.**
3	A line passes through (1, 6) and (5, -2). Find its slope and y-intercept.	**Slope = -2; y-intercept = 8.**
4	For y = (1/2)x - 5, find the slope and x-intercept.	**Slope = 1/2; x-intercept = 10.**
5	Use the table to find the line's slope and y-intercept.	**Slope = 5; y-intercept = -1.**
6	For -7x + 5y = 35, find the slope and x-intercept.	**Slope = 7/5; x-intercept = -5.**

PART 2 · APPLY IT

1. **y = 6x + 14. The slope is 6 dollars per shift. The y-intercept is 14 dollars, the amount saved before any shifts.** Add $6 per shift to the initial $14. In y = 6x + 14, the coefficient of x is the slope, and the value at x = 0 is the y-intercept.
2. **y = 80 - 10x. The slope is -10 percentage points per hour. The x-intercept is 8 hours, when the model predicts the battery reaches 0%.** Subtract 10 percentage points for each hour from 80%. Set y = 0 and solve 0 = 80 - 10x to get x = 8.

CHALLENGE

The slope means profit rises $7 per ticket. The x-intercept is 5 tickets, when profit is $0. The y-intercept is -$35, the club's profit before selling tickets. It describes a $35 loss, not a negative number of tickets.

Accept intercepts as values or ordered pairs, such as x-intercept 5 or (5, 0). For the challenge, accept an initial cost of $35 as the meaning of the negative y-intercept.