LESSON MAKER PRO

Find the Starting Point

Find slope and y-intercept in different representations.

GRADE 8 · 8.F.4b

8.F.4b "Apply the concepts of linear functions to real-world and mathematical situations. Determine the slope and the y-intercept of a linear function given multiple representations, including two points, tables, graphs, equations..."

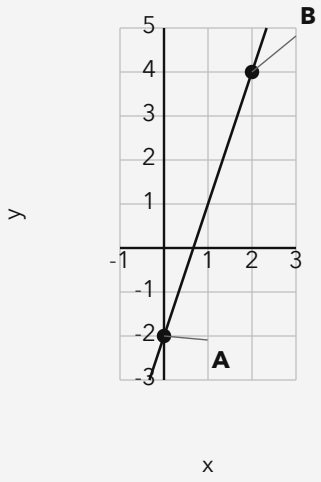
NAME _____ DATE _____

TWO CLUES ABOUT A LINE

Slope tells how much y changes when x increases by 1. Divide the change in y by the change in x to find the slope. The y-intercept is the value of y when x = 0.

WORKED EXAMPLE

Use the line and its marked points to find the slope and y-intercept.

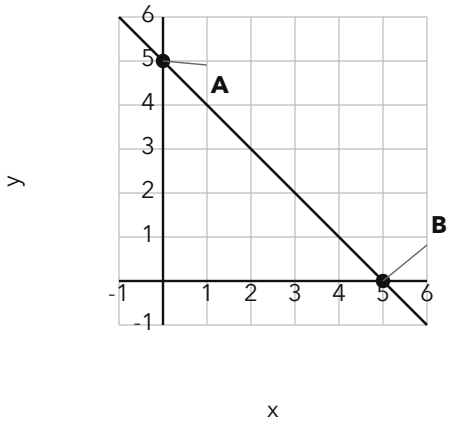


1. From A to B, the change in y is 4 - (-2) = 6.
2. The change in x is 2 - 0 = 2.
3. The slope is 6/2 = 3.
4. At x = 0, the line crosses the y-axis at -2.

Answer: Slope: 3; y-intercept: -2

PRACTICE 6 problems

1 Find the slope and y-intercept of the line shown.



ANSWER _____

2 Find the slope and y-intercept of the linear function in the table.

VALUES OF A LINEAR FUNCTION

x	y
-8	-7
-4	-5
0	-3
4	-1

ANSWER _____

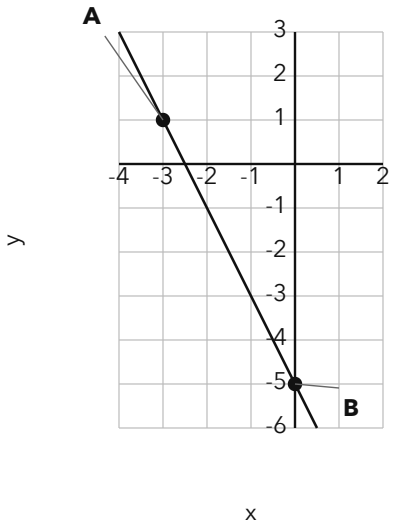
3 A line passes through (-5, 9) and (5, -1). Find its slope and y-intercept.

ANSWER _____

4 Find the slope and y-intercept of $y = -4x + 7$.

ANSWER _____

5 Find the slope and y-intercept of the line shown.



ANSWER _____

6 An elevator starts 15 feet above the ground and descends 3 feet each second. Let x be the seconds since it started and y be its height in feet. Find the slope and y-intercept.

ANSWER _____

APPLY IT Show your work

1 A video game download has 600 MB remaining when you start timing it. After 3 minutes, 420 MB remain. Assume the amount remaining changes at a constant rate. Let x be minutes and y be MB remaining. Find the slope and y-intercept, and tell what each means.

WORK SPACE

ANSWER _____

2 A custom sticker order costs $18 for 4 stickers and $30 for 8 stickers. Assume the cost is linear. Let x be the number of stickers and y be the total cost in dollars. Find the slope and y-intercept, and tell what each means.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two music lesson plans charge a signup fee plus a monthly fee. Plan A's total cost y, in dollars, after x months is shown in the table. Plan B costs y = 9x + 5. Find each plan's y-intercept. After how many months do the plans cost the same? Show how you know.

PLAN A

Months (x)	Total cost (y)
2	$27
5	$48

WORK SPACE AND ANSWER

ANSWER KEY

Find the Starting Point

GRADE 8 · 8.F.4b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the slope and y-intercept of the line shown.	**Slope: -1; y-intercept: 5**
2	Find the slope and y-intercept of the linear function in the table.	**Slope: 1/2; y-intercept: -3**
3	A line passes through (-5, 9) and (5, -1). Find its slope and y-intercept.	**Slope: -1; y-intercept: 4**
4	Find the slope and y-intercept of y = -4x + 7.	**Slope: -4; y-intercept: 7**
5	Find the slope and y-intercept of the line shown.	**Slope: -2; y-intercept: -5**
6	An elevator starts 15 feet above the ground and descends 3 feet each second. Let x be the seconds since it started and y be its height in feet. Find the slope and y-intercept.	**Slope: -3 feet per second; y-intercept: 15 feet**

PART 2 · APPLY IT

1. **Slope: -60 MB per minute, so 60 MB downloads each minute. Y-intercept: 600 MB, the amount remaining when timing began.** The slope is (420 - 600)/3 = -60 MB per minute. At x = 0, 600 MB remain.
2. **Slope: $3 per sticker. Y-intercept: $6, the fixed cost of the order.** The slope is (30 - 18)/(8 - 4) = 3 dollars per sticker. Using 18 = 3(4) + 6 gives a y-intercept of $6.

CHALLENGE

Plan A's slope is (48 - 27)/(5 - 2) = 7, so its y-intercept is 27 - 7(2) = $13. Plan B's y-intercept is $5. Setting 7x + 13 = 9x + 5 gives x = 4, so the plans cost the same after 4 months.

Accept equivalent descriptions of the y-intercept as the starting value or fixed cost. For the graph problems, students may use any two points on the printed line to calculate slope.