LESSON MAKER PRO

Line Model Moves

Use rates and starting values to solve real problems.

GRADE 8 · 8.FGR.6.2

8.FGR.6.2 "Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercepts."

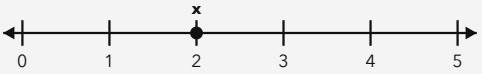
NAME _____ DATE _____

READ THE MODEL

In y = mx + b, m is the change in y for each 1 increase in x, and b is the y-value when x = 0. The y-intercept is (0, b). To find the x-intercept, set y = 0 and solve for x.

WORKED EXAMPLE

A plant-height model is y = 3x + 4, where x is weeks and y is centimeters. The marked point gives the input x. Find y, the y-intercept, and the x-intercept.



1. The marked input is x = 2.
2. Substitute: y = 3(2) + 4 = 10.
3. y-intercept: (0, 4). Set 0 = 3x + 4, so x = -4/3.

Answer: y = 10; y-intercept: (0, 4); x-intercept: (-4/3, 0)

PRACTICE 4 problems

1 For y = 4x + 7, state the slope and y-intercept.

ANSWER _____

2 Find the x-intercept of y = -3x + 12.

ANSWER _____

3 A model is y = 2x - 9. Find y when x = 5.

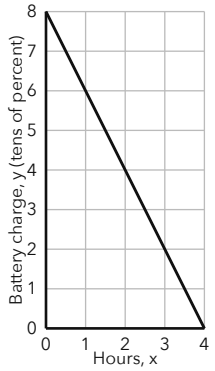
ANSWER _____

4 For y = -2x + 10, find y when x = 6. What does the slope mean?

ANSWER _____

APPLY IT Show your work

1 The graph shows y, a phone battery charge in tens of percent, after x hours. Find the charge after 3 hours. Interpret the slope and y-intercept.



ANSWER _____

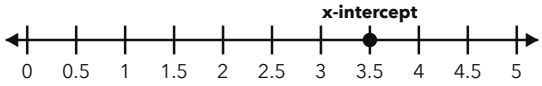
2 A music app's data use follows y = 7x + 18, where x is the number of songs downloaded and y is megabytes used. How much data is used for 6 songs? Interpret both the slope and y-intercept.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A line model has slope -4 and y-intercept 14. The marked point shows its x-intercept. Write the equation. Explain how the equation confirms the marked x-intercept.



WORK SPACE AND ANSWER

ANSWER KEY

Line Model Moves

GRADE 8 · 8.FGR.6.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 4x + 7, state the slope and y-intercept.	**Slope: 4; y-intercept: (0, 7)**
2	Find the x-intercept of y = -3x + 12.	**(4, 0)**
3	A model is y = 2x - 9. Find y when x = 5.	**1**
4	For y = -2x + 10, find y when x = 6. What does the slope mean?	**y = -2; y decreases 2 units for each 1-unit increase in x**

PART 2 · APPLY IT

1. **After 3 hours, the charge is 20%. The slope is -20 percentage points per hour. The y-intercept is 80%, the starting charge.** Read y = 2 at x = 3, then convert 2 tens of percent to 20%. The line drops 2 tens of percent each hour and starts at 8 tens of percent.
2. **60 MB; the app uses 7 MB per song and starts by using 18 MB.** Substitute x = 6: y = 7(6) + 18 = 60. The coefficient of x is the data used per song, and 18 is the data used before any songs are downloaded.

CHALLENGE

y = -4x + 14. Setting y = 0 gives 0 = -4x + 14, so x = 3.5, which matches the marked point.

Accept equivalent intercept descriptions, such as x = 4 for the x-intercept when the context does not require ordered pairs. For the battery graph, accept -2 tens of percent per hour as equivalent to -20 percentage points per hour.