LESSON MAKER PRO

Lines in Motion

Write equations from rates and starting values.

GRADE 8 · 8.AT.A.2.b

8.AT.A.2.b "Use this relationship to write equations of lines in the form y = mx for lines that pass through the origin, and in the form y = mx + b for lines that include a vertical shift from the origin, where b represents the y-intercept."

NAME _____ DATE _____

RATE AND STARTING VALUE

In y = mx + b, m is the change in y for each increase of 1 in x. The value b is y when x is 0. If the line passes through the origin, b is 0, so write y = mx.

WORKED EXAMPLE

Write an equation for the line through the points in the table.

x	y
0	7
4	19

1. At x = 0, y = 7, so b = 7.
2. The slope is (19 - 7)/(4 - 0) = 3.
3. Substitute m = 3 and b = 7 into y = mx + b.

Answer: y = 3x + 7

PRACTICE 4 problems

1 A line passes through the origin and (5, 10). Write its equation.

ANSWER _____

2 A line has slope -1 and y-intercept 6. Write its equation.

ANSWER _____

3 A line passes through (0, -5) and (6, 1). Write its equation.

ANSWER _____

4 A line passes through the origin and (8, -6). Write its equation.

ANSWER _____

APPLY IT Show your work

1 You start a game with 11 credits and earn 5 credits per round. Write an equation for your total credits y after x rounds.

WORK SPACE

ANSWER _____

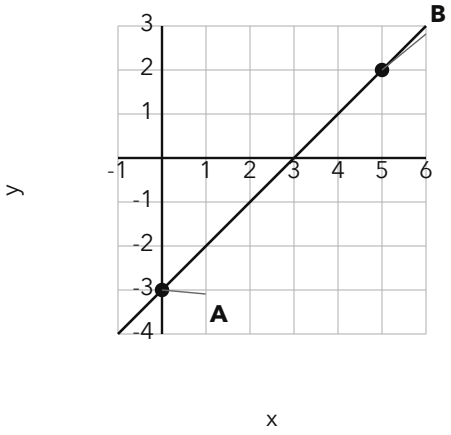
2 A phone starts at 90% battery and loses 6 percentage points each hour of streaming. Write an equation for its battery percent y after x hours.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Write an equation for the line shown. Explain how the graph gives you the slope and y-intercept.



WORK SPACE AND ANSWER

ANSWER KEY

Lines in Motion

GRADE 8 · 8.AT.A.2.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A line passes through the origin and (5, 10). Write its equation.	**y = 2x**
2	A line has slope -1 and y-intercept 6. Write its equation.	**y = -x + 6**
3	A line passes through (0, -5) and (6, 1). Write its equation.	**y = x - 5**
4	A line passes through the origin and (8, -6). Write its equation.	**y = -3/4x**

PART 2 · APPLY IT

1. **y = 5x + 11** The starting value is 11 credits, and the rate is 5 credits per round.
2. **y = -6x + 90** The starting value is 90, and the battery percent changes by -6 each hour.

CHALLENGE

y = x - 3. The line crosses the y-axis at -3. From A to B, y rises 5 while x increases 5, so the slope is 1.

Accept equivalent equations, such as y = (-3/4)x. For the challenge, accept any correct pair of points on the line to justify the slope.