LESSON MAKER PRO

Slope Stays Steady

Find slope from points and explain why it stays the same.

GRADE 8 · 8.AF.B.9.b

8.AF.B.9.b "Given two distinct points in a coordinate plane, find the slope of the line containing the two points and explain why it will be the same for any two distinct points on the line."

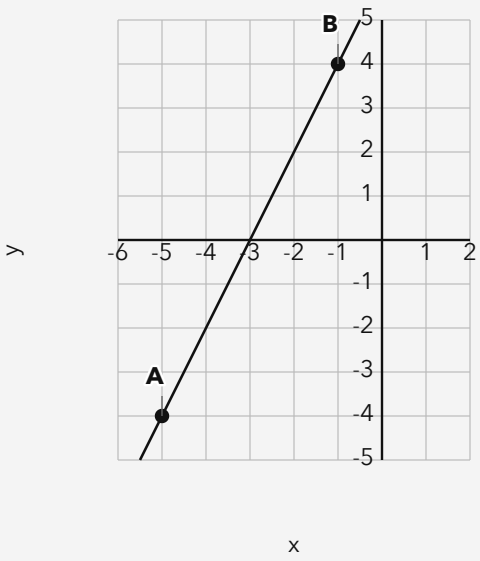
NAME _____ DATE _____

THE BIG IDEA

For two points, slope = $(y_2 - y_1)/(x_2 - x_1)$ when the run is not zero. On a straight line, changing the size of a step changes its rise and run by the same factor, so their ratio stays the same. A vertical line has zero run, so its slope is undefined.

WORKED EXAMPLE

Find the slope of the line through A and B on the grid.

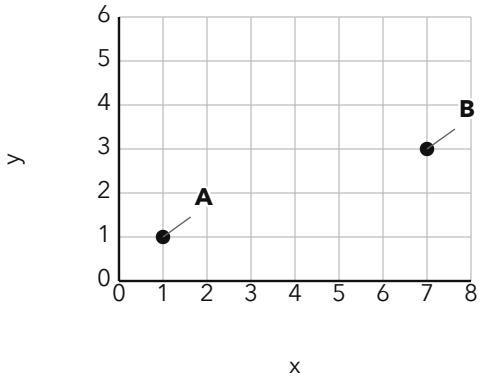


1. Read the points: A is (-5, -4) and B is (-1, 4).
2. Find the rise: 4 - (-4) = 8.
3. Find the run: -1 - (-5) = 4.
4. Divide: slope = 8/4 = 2.

Answer: 2

PRACTICE 6 problems

1 Find the slope of the line through A and B on the grid.

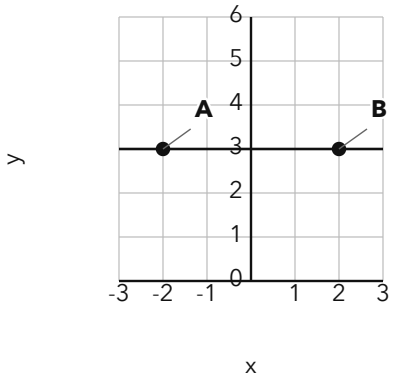


ANSWER _____

2 Find the slope of the line through (2, 7) and (6, 1).

ANSWER _____

3 Find the slope of the line through A and B on the grid.



ANSWER _____

4 Find the slope of the line through (3, -2) and (3, 6).

ANSWER _____

5 A line passes through (2, 1), (8, 7), and (10, 9). Find its slope using the first two points. Then find it using the last two points.

ANSWER _____

6 Find the slope of the line through (-2, -2) and (6, 2). Why would any other two distinct points on this line give the same slope?

ANSWER _____

APPLY IT Show your work

1 You add songs to a playlist. After 2 days, it has 11 songs. After 6 days, it has 27 songs. Let days be x and songs be y. Find the slope between these points and explain what it means.

WORK SPACE

ANSWER _____

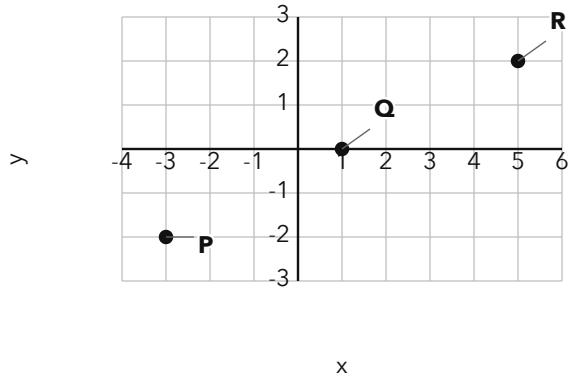
2 While you play a phone game, your phone has 86% battery after 2 minutes and 68% after 8 minutes. Let minutes be x and battery percentage be y. Find the slope between these points and explain what it means.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Use the grid to find the slope from P to Q and from P to R. Explain why any two distinct points on this line give the same slope.



WORK SPACE AND ANSWER

ANSWER KEY

Slope Stays Steady

GRADE 8 · 8.AF.B.9.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the slope of the line through A and B on the grid.	**1/3**
2	Find the slope of the line through (2, 7) and (6, 1).	**-3/2**
3	Find the slope of the line through A and B on the grid.	**0**
4	Find the slope of the line through (3, -2) and (3, 6).	**Undefined**
5	A line passes through (2, 1), (8, 7), and (10, 9). Find its slope using the first two points. Then find it using the last two points.	**First two: (7 - 1)/(8 - 2) = 1. Last two: (9 - 7)/(10 - 8) = 1.**
6	Find the slope of the line through (-2, -2) and (6, 2). Why would any other two distinct points on this line give the same slope?	**1/2. On this line, the rise is half the run between any two distinct points, so rise/run is always 1/2.**

PART 2 · APPLY IT

1. **4 songs per day between the two counts** Compute (27 - 11)/(6 - 2) = 16/4 = 4. The playlist gained an average of 4 songs per day during that time.
2. **-3 percentage points per minute between the two readings** Compute (68 - 86)/(8 - 2) = -18/6 = -3. The battery level fell by an average of 3 percentage points per minute during that time.

CHALLENGE

P to Q: 2/4 = 1/2. P to R: 4/8 = 1/2. On this straight line, each rise is half its run, so the ratio is 1/2 for any two distinct points.

Accept equivalent fractions and explanations that show rise and run change by the same factor. For the phone problem, accept a drop of 3 percentage points per minute as equivalent to a slope of -3.