LESSON MAKER PRO

Same Slope, Different Steps

Compare rise and run along a straight line.

GRADE 8 · 8.AT.A.2.a

8.AT.A.2.a "Use proportional reasoning to explain why the slope m is the same between any two points on a non-vertical line by showing that the ratios of vertical change to horizontal change between points are equivalent."

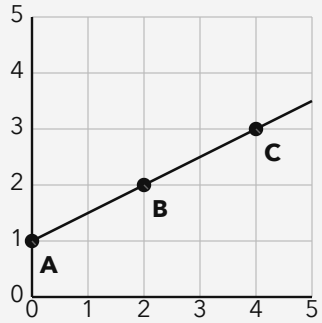
NAME _____ DATE _____

THE BIG IDEA

On a non-vertical straight line, vertical change and horizontal change have the same ratio between any two points. Divide vertical change by horizontal change to find the slope. A drop from left to right gives a negative slope.

WORKED EXAMPLE

Compare the slopes from A to B and from B to C.



1. A to B: vertical change = 1, horizontal change = 2.
2. B to C: vertical change = 1, horizontal change = 2.
3. Both change ratios are 1/2.

Answer: Both slopes are 1/2.

PRACTICE 4 problems

1 Show that slopes AB and BC match: A(0, 0), B(2, 4), C(7, 14).

ANSWER _____

2 Show that slopes AB and BC match: A(0, 12), B(3, 9), C(9, 3).

ANSWER _____

3 Show that slopes AB and AC match: A(-4, -6), B(0, -3), C(4, 0).

ANSWER _____

4 Show that slopes AB and BC match: A(-6, 8), B(-2, 6), C(6, 2).

ANSWER _____

APPLY IT Show your work

1 A video uses data at a steady rate. Use both time intervals to show that its data rate stays the same.

VIDEO DATA

Minutes	Data used (MB)
0	0
4	12
10	30

ANSWER _____

2 A game's battery level falls at a steady rate. Use both time intervals to find the rate of change.

GAME BATTERY

Hours played	Battery level (%)
0	90
2	78
5	60

ANSWER _____

CHALLENGE One step up

A(-2, 7), B(2, 1), and C(6, x) lie on one straight line. Find x, then show that slopes AB and BC match.

WORK SPACE AND ANSWER

ANSWER KEY

Same Slope, Different Steps

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Show that slopes AB and BC match: A(0, 0), B(2, 4), C(7, 14).	**AB: 4/2 = 2. BC: 10/5 = 2.**
2	Show that slopes AB and BC match: A(0, 12), B(3, 9), C(9, 3).	**AB: -3/3 = -1. BC: -6/6 = -1.**
3	Show that slopes AB and AC match: A(-4, -6), B(0, -3), C(4, 0).	**AB: 3/4. AC: 6/8 = 3/4.**
4	Show that slopes AB and BC match: A(-6, 8), B(-2, 6), C(6, 2).	**AB: -2/4 = -1/2. BC: -4/8 = -1/2.**

PART 2 · APPLY IT

1. **0 to 4 minutes: 12/4 = 3 MB/min. 4 to 10 minutes: 18/6 = 3 MB/min.** Subtract the data values and time values for each interval. Both ratios are 3 MB/min.
2. **0 to 2 hours: -12/2 = -6 percentage points per hour. 2 to 5 hours: -18/3 = -6 percentage points per hour.** For each interval, divide the change in battery level by the change in hours. Both ratios are -6 percentage points per hour.

CHALLENGE

x = -5. AB: (1 - 7)/(2 - (-2)) = -6/4. BC: (-5 - 1)/(6 - 2) = -6/4.

Accept equivalent fractions or simplified slopes when the two change ratios are shown. For the battery problem, the rate is a decrease of 6 percentage points per hour.