MATHEMATICS · GRADES 7-9

Slope as Rise over Run

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you tell how steep something is with one number, like a wheelchair ramp, a driveway, or a road climbing a hill, so you can compare steepness or check it is safe. A ramp that rises a little over a long run is gentle, while one that rises a lot over a short run is steep, and the slope number captures that difference. Builders use it to check a ramp is not too steep to use, and road signs use it to warn drivers about a hill ahead. One number lets you compare any two slopes fairly, no matter how long they are.



Rule

$$\text{Slope} = \frac{\text{rise}}{\text{run}}.$$

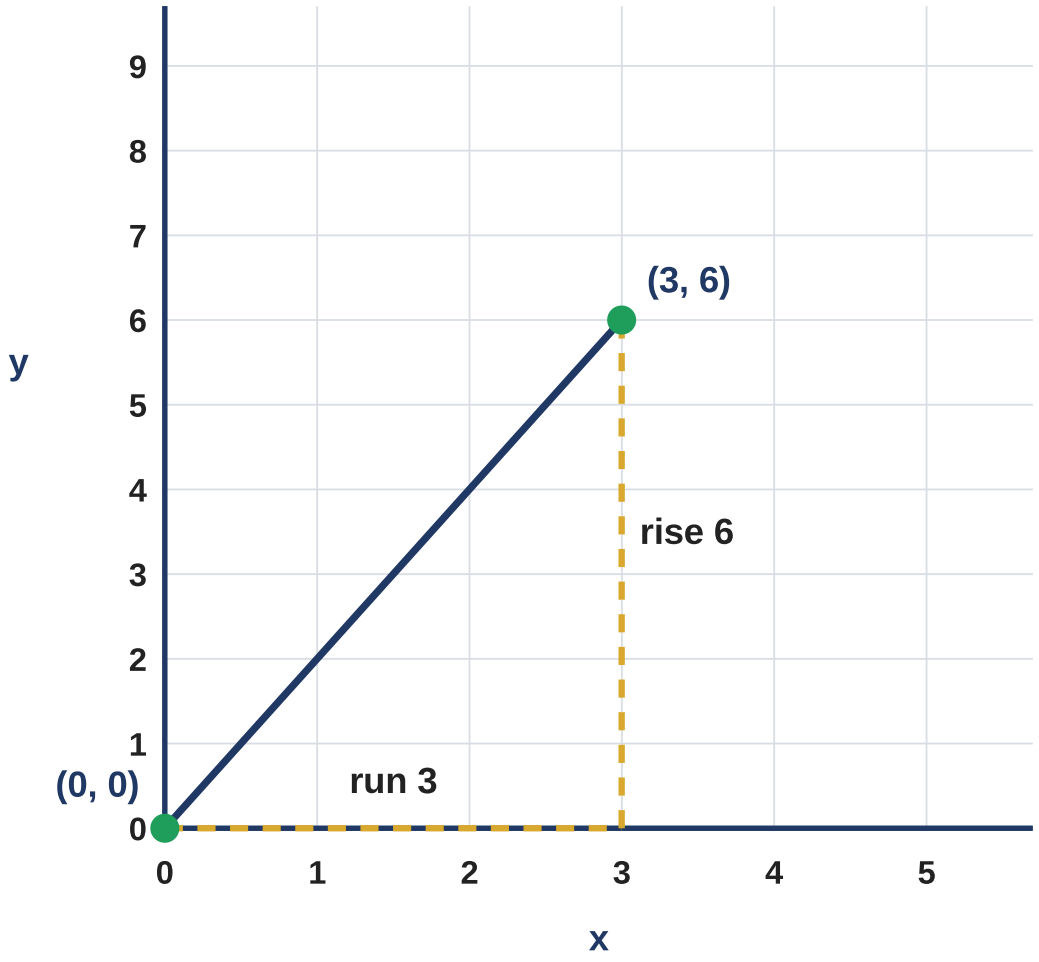
Rise is how much the line goes up, run is how much it goes across, and the slope is the rise divided by the run.

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Worked examples

EXAMPLE 1

Q Find the slope of a line that rises 6 and runs 3



SOLUTION

Write slope as rise over run: $\frac{6}{3}$

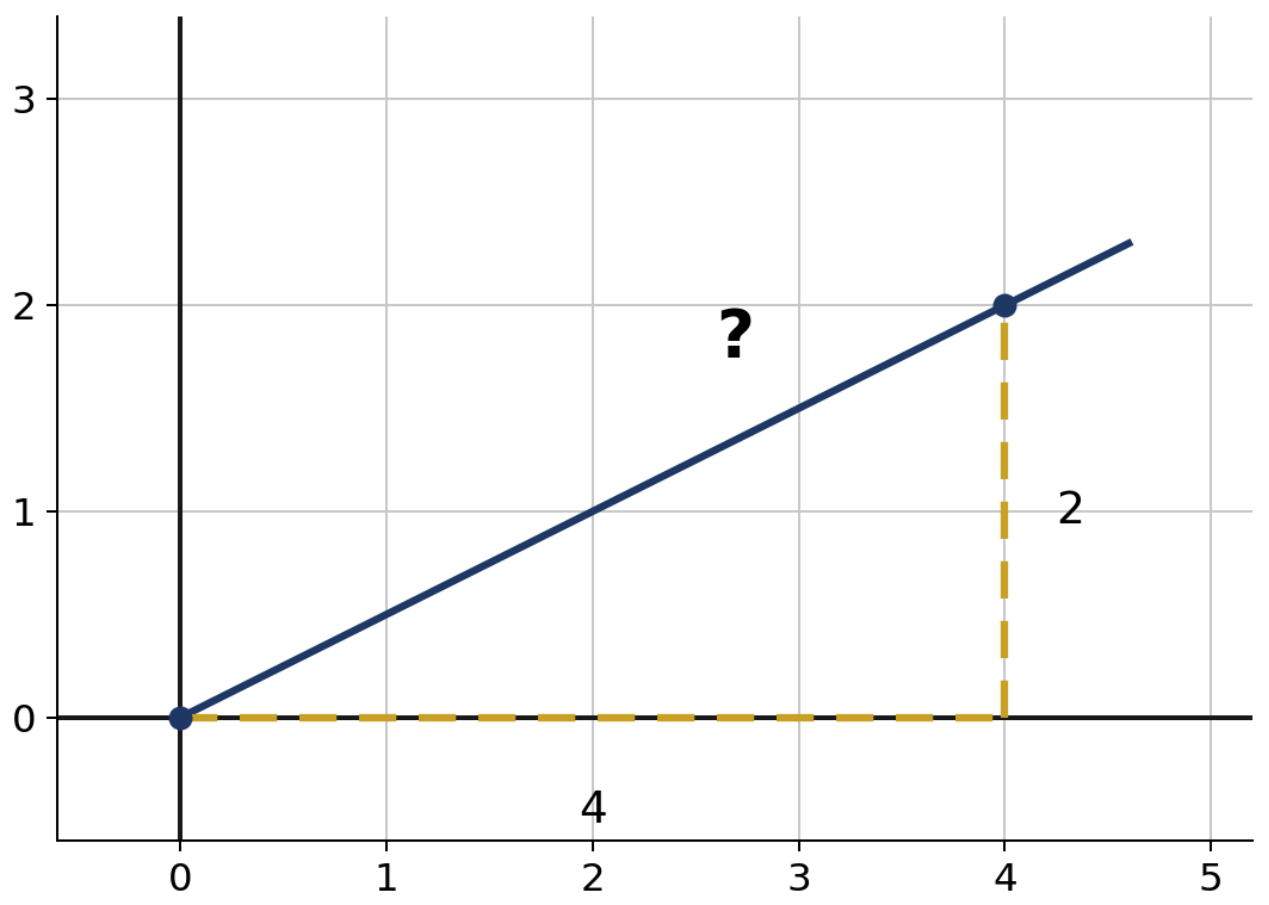
Divide: $6 \div 3 = 2$

The slope is 2.

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EXAMPLE 2

Q Find the slope of a line that rises 2 and runs 4



SOLUTION

Write slope as rise over run: $\frac{2}{4}$

Simplify: $2 \div 2 = 1$ and $4 \div 2 = 2$

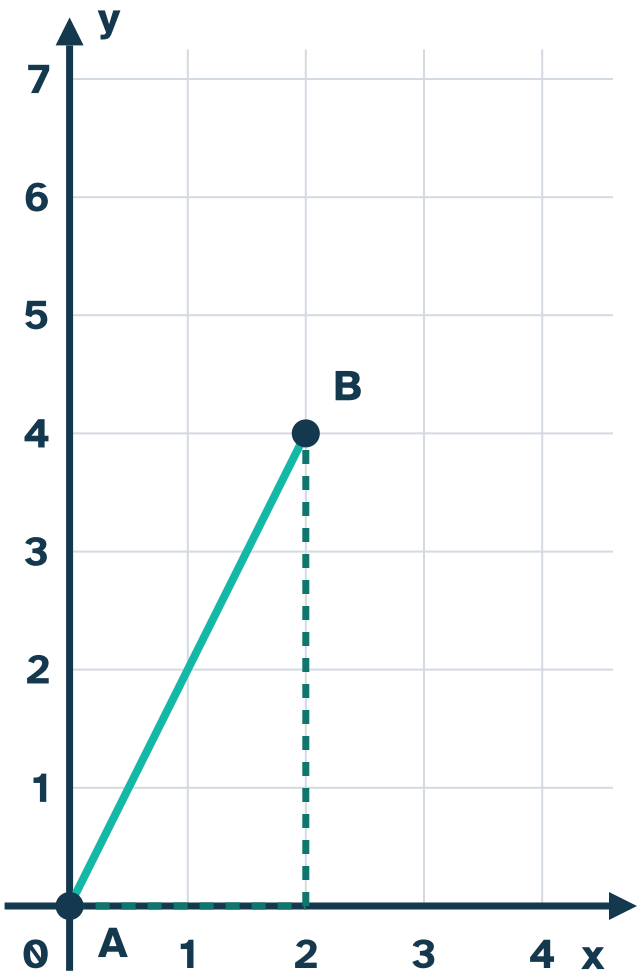
$\frac{2}{4} = \frac{1}{2}$

The slope is $\frac{1}{2}$.

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Practice questions

1 Count the rise and the run from the triangle. What is the slope of the line?



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2

Line A has slope 2 and line B has slope $\frac{1}{2}$. Which line is steeper?

A Line A

B Line B

C They are equally steep

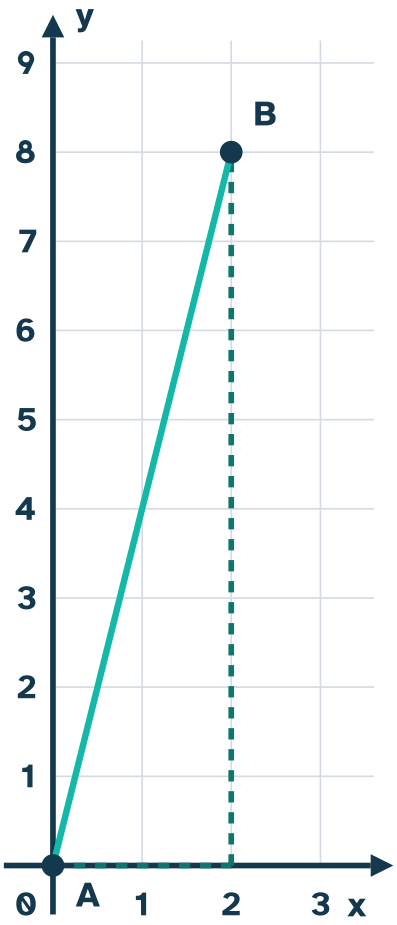
D You cannot tell

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3 **For each 1 unit you move across, how many units do you go up? That number is the slope.**



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4 A line has slope 3 and rises 6 units. How far across does it run?

- **A** 2
- **B** 3
- **C** 6
- **D** 18

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5 The rise and the run are equal. What is the slope of the line?

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6 A flat road does not go up at all. What is the slope of the road?

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7 A line has slope 4. For each 1 unit across, how many units up does it go?

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8 A line has slope 3 and a run of 2 units. What is its rise?

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9 A line goes up 3 units for every 1 unit across. What is its slope?

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10 A line has slope 3. Which rise and run could it have?

A rise 3, run 1

B rise 1, run 3

C rise 3, run 3

D rise 1, run 1

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ANSWER KEY

1. 2

2. Line A

3. 4

4. 2

5. 1

6. 0

7. 4

8. 6

9. 3

10. rise 3, run 1

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