MATHEMATICS · GRADES 7-9

Positive, Negative, Zero, and Undefined Slopes

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you read a graph at a glance, like seeing whether sales are rising, falling, flat, or shooting straight up. A sales graph that climbs means business is growing, one that falls means it is shrinking, and one that runs flat means nothing changed. A road that climbs steadily, a flat stretch, and a cliff face are the same four shapes in real life. Reading the slope tells you the story of the graph before you read a single number on it.



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Rule

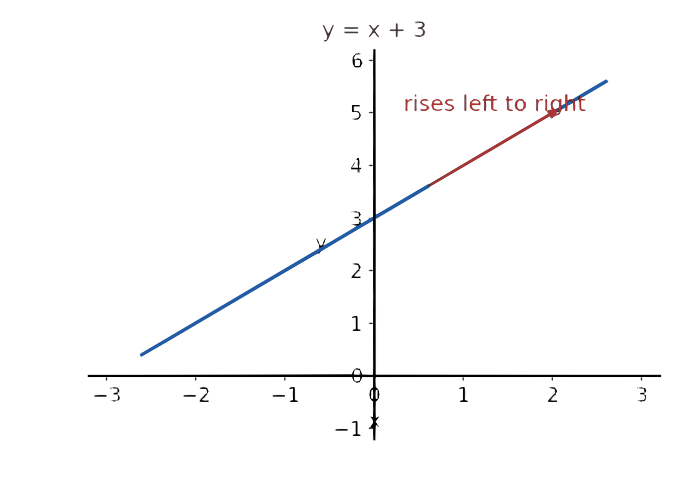
A line that rises from left to right has a positive slope.

A line that falls from left to right has a negative slope. A horizontal line has a slope of zero, because it never rises. A vertical line has an undefined slope, because its run is zero.

Worked examples

EXAMPLE 1

Q Classify a line that rises from left to right



SOLUTION

Look at the direction as you read left to right.

The line goes up, so the rise is positive.

The slope is positive.

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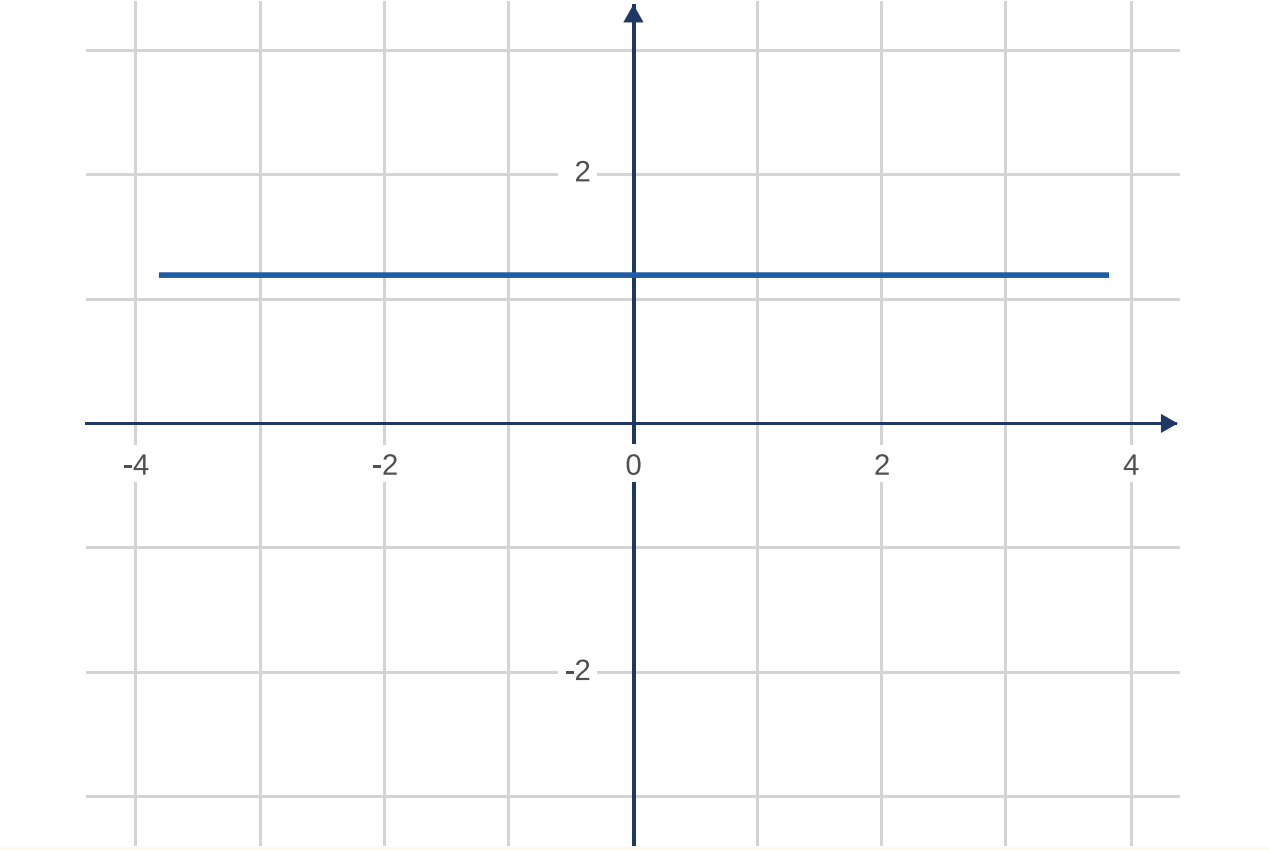
EXAMPLE 2

Q Classify a horizontal line



SOLUTION

A horizontal line never rises or falls.

Its rise is 0 for any run.

The slope is zero.

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Practice questions

1 A line climbs from left to right. Is the slope positive or negative?

- **A** Positive
- **B** Negative

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2 A line runs through (0, 0) and (2, 6). What is its slope?

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3 The line runs flat, left to right. What is the slope of the line?

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4 The line runs straight up and down. What is the slope of the line?

- A Zero
- B Undefined
- C Positive
- D Negative

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5 Which line is steeper: one with slope 2 or one with slope 5?

- A The one with slope 5
- B The one with slope 2

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6 A line has a slope of 0. Does it run flat or straight up and down?

- **A** Flat
- **B** Straight up and down

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7 A line has an undefined slope. What is its run?

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8 A line rises 8 units over a run of 4 units. What is its slope?

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9 A line has a slope of 4. How much does it rise when it runs 3 units?

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10 Order these slopes from least steep to steepest: 4, 1, 2.

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ANSWER KEY

1. Positive

2. 3

3. 0

4. Undefined

5. The one with slope 5

6. Flat

7. 0

8. 2

9. 12

10. 1, 2, 4

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