

A Line Passes Through These Points: (0,6),(2,15) . What Is Its Slope? (provide One Decimal Place)

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Understanding the concept of slope is fundamental in coordinate geometry, especially when analyzing lines passing through specific points. In this article, we will explore how to determine the slope of a line passing through the points (0,6) and (2,15). We will break down the steps involved in calculating the slope, explain the significance of the slope value, and provide practical examples to reinforce learning. Whether you're a student preparing for exams or a math enthusiast, this guide will help you grasp the process clearly and accurately.

What Is the Slope of a Line?

Definition of Slope

The slope of a line measures how steep the line is. It describes the rate at which the y-coordinate (vertical change) changes in relation to the x-coordinate (horizontal change). Mathematically, the slope (often represented by the letter m) is given by:

$$m = \frac{\text{change in } y}{\text{change in } x} = \frac{\Delta y}{\Delta x}$$

This ratio indicates whether the line rises, falls, or remains horizontal as you move along it.

Importance of Slope in Coordinate Geometry

Knowing the slope helps in:

- Predicting the behavior of the line (increasing, decreasing, or constant).
- Formulating the equation of the line.
- Understanding relationships between variables in real-world contexts.

How to Calculate the Slope Between Two Points

Given Points

Suppose you have two points on a coordinate plane:

- Point 1: (x_1, y_1)
- Point 2: (x_2, y_2)

For our specific problem:

- Point 1: $(0, 6)$
- Point 2: $(2, 15)$

Applying the Slope Formula

The formula to find the slope (m) is:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Plugging in the given points:

$$m = \frac{15 - 6}{2 - 0}$$

Calculating numerator and denominator:

$$m = \frac{9}{2}$$

Which simplifies to:

$$m = 4.5$$

Therefore, the slope of the line passing through points $(0,6)$ and $(2,15)$ is 4.5.

Interpreting the Slope

What Does a Slope of 4.5 Mean?

A slope of 4.5 indicates that for every one unit increase in x (horizontal movement), y (vertical movement) increases by 4.5 units. This signifies a relatively steep line that ascends from left to right, reflecting a positive relationship between x and y.

Visualizing the Line

- Starting at point (0,6), if you move 1 unit to the right along the x-axis, the y-value rises by approximately 4.5 units.
- Moving from (0,6) to (2,15), the y-value increases from 6 to 15, consistent with the slope calculation.

Formulating the Equation of the Line

Once the slope is known, the next step is often to write the line's equation in slope-intercept form:

$$y = mx + b$$

where:

- m is the slope,
- b is the y-intercept (the point where the line crosses the y-axis).

Finding the Y-Intercept (b)

Given the slope ($m = 4.5$), and one point, say (0,6):

$$6 = 4.5 \times 0 + b$$

$$b = 6$$

Thus, the equation of the line is:

$$y = 4.5x + 6$$

This equation can be used to predict y-values for any x-value along the line.

Practical Applications of Slope Calculations

Real-World Contexts

Understanding and calculating slopes are essential in various fields:

- **Physics:** Determining velocity when given displacement over time.
- **Economics:** Analyzing cost functions and rate of change.
- **Engineering:** Designing slopes and gradients for roads and ramps.

Educational Significance

Mastering slope calculations enhances problem-solving skills and lays the foundation for more advanced topics like linear equations, inequalities, and calculus.

Summary and Key Takeaways

- The slope of a line passing through points (0,6) and (2,15) is 4.5.
- This slope indicates a steep, upward-sloping line.
- The formula for slope, $\frac{\Delta y}{\Delta x}$, is straightforward to apply with two points.
- Using the slope and a point, you can derive the equation of the line in slope-intercept form.
- Calculating slopes is fundamental in understanding linear relationships across various disciplines.

Conclusion

Determining the slope of a line passing through two points is a simple yet powerful skill in coordinate geometry. For the points (0,6) and (2,15), the slope is calculated as 4.5 when rounded to one decimal place. This value provides insight into the line's behavior and allows for the formulation of its equation. Whether analyzing mathematical problems or applying these concepts in real-world scenarios, mastering slope calculations is essential for students and professionals alike. Remember, practice with different points will enhance your confidence and understanding of how slopes characterize the steepness and direction of lines on the Cartesian plane.

Frequently Asked Questions

What is the slope of the line passing through points (0,6) and (2,15)?

4.5

How do you calculate the slope of a line given two points?

You subtract the y-coordinates and divide by the difference of the x-coordinates: $(y_2 - y_1) / (x_2 - x_1)$.

What is the formula for finding the slope between two points?

Slope (m) = $(y_2 - y_1) / (x_2 - x_1)$.

If a line passes through (0,6) and (2,15), what is the change in y?

The change in y is $15 - 6 = 9$.

What is the change in x for the points (0,6) and (2,15)?

The change in x is $2 - 0 = 2$.

What is the slope when the change in y is 9 and the change in x is 2?

The slope is $9 / 2 = 4.5$.

Why is it important to compute the slope of a line?

The slope indicates the steepness and direction of the line, which is essential for graphing and understanding relationships between variables.

Can the slope of a line passing through (0,6) and (2,15) be negative?

No, in this case, the slope is positive because the y-value increases as x increases.

Additional Resources

A Line Passes Through These Points: (0,6), (2,15). What Is Its Slope? (Provide One Decimal Place)

Understanding the slope of a line passing through two points is a fundamental concept in coordinate geometry. Whether you're a student brushing up on math fundamentals or a professional needing a quick calculation, mastering how to find the slope is essential. In this comprehensive guide, we'll explore the process step-by-step, ensuring clarity and confidence in solving problems involving points and slopes.

Introduction to the Concept of Slope

In coordinate geometry, the slope of a line measures its steepness and direction. It is often represented by the letter m . The slope indicates how much the y-coordinate (vertical change) of a point on the line changes relative to the x-coordinate (horizontal change).

For any two points on a line, the slope is calculated as the ratio of the "rise" (change in y) over the

"run" (change in x).

Why Is Calculating Slope Important?

Knowing how to find the slope allows you to:

- Determine the inclination of a line - whether it's rising, falling, or horizontal.
- Write the equation of a line if you have points or slope.
- Understand relationships between variables in real-world data.
- Solve geometric problems involving lines and their intersections.

Step-by-Step Guide to Finding the Slope

Let's focus on the problem: A line passes through the points (0,6) and (2,15). What is its slope? Our goal is to find the slope m with one decimal place precision.

Step 1: Identify the Coordinates

The two points given are:

- Point 1: $(x_1, y_1) = (0, 6)$
- Point 2: $(x_2, y_2) = (2, 15)$

Step 2: Recall the Slope Formula

The slope m between two points is calculated as:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

This formula computes the ratio of the change in y to the change in x .

Step 3: Substitute the Coordinates into the Formula

Plugging in the values:

$$m = \frac{15 - 6}{2 - 0}$$

$$m = \frac{9}{2}$$

Step 4: Simplify the Fraction

$$m = 4.5$$

Since the problem requests the slope rounded to one decimal place, the answer is already in the proper form:

The slope of the line passing through (0,6) and (2,15) is 4.5.

Additional Insights and Practical Applications

Understanding the Slope Value

- A positive slope ($m > 0$) indicates that the line rises as x increases.
- Here, $m = 4.5$ means that for every increase of 1 unit in x , y increases by 4.5 units.
- The large positive value signifies a relatively steep incline.

Visualizing the Line

Plotting the points:

- At $x = 0$, $y = 6$
- At $x = 2$, $y = 15$

Connecting these points results in a line that sharply ascends from left to right.

Writing the Equation of the Line

Knowing the slope and a point (say, $(0,6)$), you can write the line's equation in slope-intercept form:

$$[y = mx + b]$$

Substituting the known values:

$$[y = 4.5x + 6]$$

This equation can be used to find y for any x along the line.

Common Mistakes to Avoid

- Swapping points: Remember that the order of points affects the sign of the slope. The calculation above correctly uses (x_1, y_1) and (x_2, y_2) .
- Ignoring the need for one decimal place: Always round your answer to one decimal place as specified.
- Dividing by zero: If $x_1 = x_2$, the slope is undefined, indicating a vertical line.

Practice Problems

To solidify your understanding, consider practicing with these points:

1. Points: $(1, 2)$ and $(3, 8)$

Question: Find the slope rounded to one decimal place.

2. Points: $(-2, 4)$ and $(2, -2)$

Question: Calculate the slope.

3. Points: (5, 10) and (5, 20)

Question: What is the slope? (Hint: Think about vertical lines.)

Summary

Calculating the slope of a line passing through two points involves a straightforward application of the slope formula:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

For the points (0,6) and (2,15), the calculation yields:

$$m = \frac{15 - 6}{2 - 0} = \frac{9}{2} = 4.5$$

This slope tells us that the line rises 4.5 units vertically for each 1 unit increase horizontally, giving a clear picture of its steepness.

Mastering this process not only enhances your algebra skills but also lays the foundation for understanding more complex geometric concepts and real-world data analysis.

Final Thoughts

Whether you're tackling homework, preparing for exams, or working on professional projects, being comfortable with calculating the slope is invaluable. Just remember to:

- Identify your points carefully.
- Plug into the slope formula accurately.
- Simplify and round your answer as needed.

With practice, finding the slope between any two points will become an effortless and reliable skill in your mathematical toolkit.

[A Line Passes Through These Points 0 6 2 15 What Is Its Slope Provide One Decimal Place](#)

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