

The Slope Of The Line Below Is 0.8. Write The Equation Of The Line In Point-slopeform, Using The Coordinates

The Slope Of The Line Below Is 0.8. Write The Equation Of The Line In Point-slopeform, Using The Coordinates is a common instruction in algebra and coordinate geometry that helps students understand how to derive the equation of a line from its slope and a point on the line. Mastering this skill is essential for solving various mathematical problems involving linear equations, graphing, and understanding relationships between variables. In this article, we will explore what the slope of 0.8 means, how to write the equation of a line in point-slope form using given coordinates, and provide practical examples to solidify your understanding.

Understanding the Slope of 0.8

What Does a Slope of 0.8 Represent?

The slope of a line indicates its steepness and the direction it travels as you move along the line. Specifically:

- A positive slope, such as 0.8, means the line rises as you move from left to right.
- The value 0.8 signifies that for every 1 unit increase in the x-coordinate, the y-coordinate increases by 0.8 units.

This fractional rise-over-run ratio is fundamental in understanding the behavior of the line and predicting its points.

Interpreting the Slope Numerically

- A slope of 0.8 can be written as the fraction $\frac{4}{5}$, which simplifies understanding the rate of change.
- The line is relatively gentle compared to steeper slopes like 2 or 3, but it still indicates a consistent increase.
- Knowing the slope helps in graphing the line accurately and understanding the relationship between the variables involved.

Point-Slope Form of a Line

What Is Point-Slope Form?

The point-slope form is a way to write the equation of a line when you know:

- The slope of the line (m)
- The coordinates of a specific point on the line $((x_1, y_1))$

The general formula is:

$$y - y_1 = m(x - x_1)$$

Where:

- m is the slope
- $((x_1, y_1))$ is a point on the line

Why Use Point-Slope Form?

- It provides a straightforward method to write the line's equation when the slope and a point are known.
- It is especially useful in real-world problems where you are given specific data points.
- It serves as a stepping stone to convert into slope-intercept form or standard form.

Writing the Equation in Point-Slope Form Using Coordinates

Step-by-Step Process

1. Identify the slope (m): In this case, $m = 0.8$.
2. Choose or be given a point $((x_1, y_1))$: This could be any point on the line.
3. Plug into the point-slope formula: Substitute m , x_1 , and y_1 into $y - y_1 = m(x - x_1)$.

Example 1: Using a Specific Point

Suppose the point on the line is $((2, 3))$. The steps would be:

$$y - 3 = 0.8(x - 2)$$

This is the equation of the line in point-slope form using the given coordinates.

Example 2: Using a Different Point

If the point is $((-1, 4))$:

$$y - 4 = 0.8(x - (-1))$$

which simplifies to:

$$y - 4 = 0.8(x + 1)$$

Practical Applications and Additional Tips

Converting to Other Forms

- Slope-Intercept Form: To convert the point-slope form to $(y = mx + b)$, expand and simplify:

For example, starting with:

$$(y - y_1 = m(x - x_1))$$

Expand:

$$(y = m(x - x_1) + y_1)$$

Substitute the knowns and simplify accordingly.

- Standard Form: Rearrange to $(Ax + By = C)$ for certain applications.

Graphing the Line

- Use the point and the slope to plot the line accurately.
- From the given point, use the slope to find additional points.
- Draw the line through these points for a visual representation.

Real-World Examples

- Economics: Understanding the rate of change of costs or revenues.
- Physics: Describing the velocity of an object over time.
- Statistics: Modeling data points with linear regression.

Summary of Key Steps to Write the Equation of a Line with Slope 0.8 and Given Coordinates

1. Identify the slope $(m = 0.8)$.
2. Choose or be provided with a point $((x_1, y_1))$ on the line.
3. Plug these into the point-slope formula: $(y - y_1 = m(x - x_1))$.
4. Simplify or convert to other forms as needed.

Conclusion

Understanding how to write the equation of a line when given a slope of 0.8 and specific coordinates is an essential skill in algebra. The point-slope form offers flexibility and clarity, especially when working with real-world data or complex problems. By mastering this process, students and professionals alike can analyze linear relationships effectively, graph lines accurately, and apply these concepts across various fields.

Whether you're solving a math problem, analyzing data, or modeling real-world scenarios, knowing how to express a line's equation using point-slope form is a powerful tool in your mathematical toolkit. Remember to practice with different points and slopes to become confident in translating between various forms of linear equations.

Frequently Asked Questions

What is the point-slope form of a line with a slope of 0.8 passing through the point (2, 3)?

The point-slope form is $y - 3 = 0.8(x - 2)$.

How do you write the equation of a line with slope 0.8 using point-slope form if the point given is (5, 10)?

The equation is $y - 10 = 0.8(x - 5)$.

If the slope of a line is 0.8 and it passes through the point (0, 4), what is its point-slope form?

The point-slope form is $y - 4 = 0.8(x - 0)$, which simplifies to $y - 4 = 0.8x$.

Given a line with slope 0.8 and passing through (-3, 7), what is the point-slope equation?

The equation is $y - 7 = 0.8(x + 3)$.

Why is the point-slope form useful for writing the equation of a line with a known slope and point?

Because it directly incorporates the slope and a specific point, making it easy to write the line's equation without solving for y-intercept.

Can the point-slope form be used to find the equation of a line

when only the slope and a point are known? How?

Yes, by substituting the known slope and point into the formula $y - y_1 = m(x - x_1)$.

If the slope of a line is 0.8 and the point provided is (-1, 2), what is the point-slope form of the line?

The equation is $y - 2 = 0.8(x + 1)$.

What does the slope of 0.8 tell us about the line's steepness in the point-slope equation?

It indicates a moderate incline, meaning for each increase of 1 in x , y increases by 0.8.

How would you convert the point-slope form $y - y_1 = m(x - x_1)$ into slope-intercept form?

By solving for y : $y = m(x - x_1) + y_1$.

Is it necessary to know the y-intercept when writing the point-slope form of the line?

No, the point-slope form only requires a point and the slope; the y-intercept can be found later if needed.

Additional Resources

The Slope of the Line Below Is 0.8. Write the Equation of the Line in Point-Slope Form, Using the Coordinates

Understanding how to write the equation of a line given its slope and a point on the line is a fundamental skill in algebra and coordinate geometry. When the slope of the line below is 0.8, it provides a crucial piece of information that helps us formulate the line's equation in a straightforward manner. This guide will walk you through the process of deriving the point-slope form of the equation, assuming you have a specific point on the line, and explain each step in detail to enhance your comprehension and confidence.

What Is the Point-Slope Form?

Before diving into the specifics, it's essential to understand what the point-slope form of a line's equation is and why it is useful.

The point-slope form of a line's equation is expressed as:

$$y - y_1 = m(x - x_1)$$

Where:

- (x_1, y_1) is a specific point on the line.
- m is the slope of the line.

This form is particularly useful because it directly incorporates both the slope and a known point on the line, making it easy to write the equation when these are known.

The Significance of the Slope Being 0.8

In our scenario, we are told that the slope of the line below is 0.8. This decimal represents the rate of change of y with respect to x across the line. A slope of 0.8 indicates that for every increase of 1 unit in x , y increases by 0.8 units.

Interpreting the Slope:

- Positive slope (like 0.8): the line rises as x increases.
- Steepness: Since 0.8 is less than 1, the line is relatively gentle compared to steeper slopes like 2 or 3.
- Direction: The line trends upward from left to right.

Step-by-Step Guide to Write the Equation in Point-Slope Form

Step 1: Identify the Known Point

To write the equation in point-slope form, you must have a specific coordinate point (x_1, y_1) on the line. This point could be provided directly or derived from context.

Example: Suppose the point is $(3, 4)$. If not given, you can choose any point that lies on the line, but in most problems, the point is specified.

Step 2: Recall the Slope

The given slope $m = 0.8$.

Step 3: Plug Values into the Point-Slope Equation

Using the formula:

$$y - y_1 = m(x - x_1)$$

Substitute (x_1, y_1) and m :

$$y - 4 = 0.8(x - 3)$$

This is the point-slope form of the line passing through $(3, 4)$ with a slope of 0.8.

General Approach for Different Points

If the point is different, say (x_1, y_1) , the process remains the same:

1. Write the point-slope form: $y - y_1 = 0.8(x - x_1)$
2. Substitute the specific point coordinates into the formula.

Example: If the point is $(5, 2)$, then:

$$y - 2 = 0.8(x - 5)$$

Visualizing the Line

Understanding the visual aspect helps reinforce the algebraic form. With a slope of 0.8, the line:

- Rises 0.8 units vertically for every 1 unit horizontally.
- Passes through the chosen point.

Plotting the point and using the slope, you can sketch the line accurately.

Additional Tips and Common Pitfalls

1. Ensure Correct Signage

- If the slope were negative, say -0.8, the line would descend as x increases.
- Always pay attention to the sign and the point coordinates.

2. Use the Correct Coordinates

- The point used in the formula must lie on the line.
- Double-check your coordinate substitutions.

3. Convert to Other Forms if Needed

- After writing in point-slope form, you can rearrange to slope-intercept form ($y = mx + b$) or standard form ($Ax + By + C = 0$).

Practice Exercises

To solidify your understanding, try the following:

1. Write the equation of the line with a slope of 0.8 passing through $(1, 2)$.
2. Given the point $(7, -3)$ and the slope 0.8, formulate the point-slope form.
3. If the line passes through $(0, 5)$ with the same slope, what is the point-slope equation?

Answers:

1. $y - 2 = 0.8(x - 1)$
2. $y + 3 = 0.8(x - 7)$
3. $y - 5 = 0.8(x - 0)$

Real-World Applications

Understanding how to write the equation of a line in point-slope form has practical applications beyond pure mathematics:

- Economics: Modeling cost or revenue functions where the rate of change is constant.
- Physics: Describing linear motion with a known starting point and constant velocity.
- Engineering: Designing systems with predictable linear relationships.

Summary

In conclusion, when the slope of the line below is 0.8, and you have a known point (x_1, y_1) on the line, writing the equation in point-slope form is a straightforward process:

- Recall the formula: $y - y_1 = m(x - x_1)$
- Substitute the known slope and point coordinates.
- Simplify if necessary for your specific context.

Mastering this skill enhances your ability to analyze and interpret linear relationships efficiently and accurately. Whether you're solving algebraic problems or applying these concepts in real-world scenarios, understanding the connection between slope, points, and line equations is fundamental to success in mathematics and related fields.

The Slope Of The Line Below Is 0.8 Write The Equation Of The Line In Point Slopeform Using The Coordinates

The Slope Of The Line Below Is 0.8 Write The Equation Of The Line In Point Slopeform Using The Coordinates

Related Articles

- [The Density Of A 3.539 M HNO₃ Aqueous Solution Is 1.150 G/ml. At 20C. Calculate The Molality Of The Solution.](#)
- [Tom Operates An Illegal Drug-running Operation And Incurred The Following Expenses: Salaries \\$ 75,000Illegal](#)
- [The _____ Perspective Emphasizes Cohesion, While The _____ Perspective Emphasizes Friction In Society.](#)

[Back to Home](#)