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Point Slope Form Worksheet

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Part 1: Building a Foundation

What is the point-slope form of a linear equation?

Hint: Think about the formula that includes a slope and a point.

○ A) $y = mx + b$
○ B) $Ax + By = C$
○ C) $y - y_1 = m(x - x_1)$
○ D) $y = \frac{y_2 - y_1}{x_2 - x_1}$

Which of the following are components of the point-slope form equation? (Select all that apply)

Hint: Identify the elements that make up the equation.

☐ A) Slope m
☐ B) A point (x_1, y_1)
☐ C) Y-intercept b
☐ D) Coefficients A, B, C

Explain in your own words what the slope of a line represents and how it is calculated.

Hint: Consider the rise over run concept.

List the steps to convert a point-slope form equation to slope-intercept form.

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Hint: Think about isolating y in the equation.

1. Step 1

2. Step 2

3. Step 3

What does the slope m indicate about a line on a graph?

Hint: Consider what slope tells you about the line's angle.

○ A) The point where the line crosses the y-axis
○ B) The steepness and direction of the line
○ C) The length of the line
○ D) The midpoint of the line

Part 2: Understanding and Interpretation

If the slope of a line is negative, what does this indicate about the line's direction?

Hint: Think about how the line moves from left to right.

○ A) The line is horizontal
○ B) The line slopes upwards from left to right
○ C) The line slopes downwards from left to right
○ D) The line is vertical

Which of the following statements are true about converting point-slope form to standard form? (Select all that apply)

Hint: Consider the requirements for standard form.

☐ A) The coefficients A, B, C must be integers.
☐ B) The slope must be recalculated.
☐ C) The equation should be rearranged to Ax + By = C.
☐ D) The point (x_1, y_1) changes.

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Describe how you would graph a line given its equation in point-slope form.

Hint: Think about starting from a point and using the slope.

Part 3: Application and Analysis

Given the point (3, 4) and a slope of 2, what is the equation of the line in point-slope form?

Hint: Use the point-slope formula with the given point and slope.

○ A) y - 4 = 2(x - 3)
○ B) y = 2x + 4
○ C) y - 3 = 2(x - 4)
○ D) y = 2x - 3

Which of the following are correct conversions of the point-slope equation y - 1 = 3(x + 2) to slope-intercept form? (Select all that apply)

Hint: Distribute and simplify to find the slope-intercept form.

☐ A) y = 3x + 7
☐ B) y = 3x + 6
☐ C) y = 3x + 5
☐ D) y = 3x + 1

A line passes through the point (5, -2) and has a slope of $-\frac{1}{2}$. Write the equation of the line in point-slope form and convert it to standard form.

Hint: Start with the point-slope formula and rearrange.

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Part 4: Evaluation and Creation

If two lines have the same slope but different y-intercepts, what can be said about their relationship?

Hint: Consider the geometric relationship between the lines.

◯ A) They are parallel.
◯ B) They are perpendicular.
◯ C) They intersect at the origin.
◯ D) They are the same line.

Which of the following changes will affect the slope of a line? (Select all that apply)

Hint: Think about what defines the slope in an equation.

☐ A) Changing the point (x_1, y_1)
☐ B) Changing the slope m
☐ C) Adding a constant to the equation
☐ D) Multiplying the entire equation by a non-zero constant

Analyze the effect of changing the slope in the point-slope form equation on the graph of the line. Provide examples with different slopes.

Hint: Consider how different slopes change the angle of the line.

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Which of the following equations represents a line parallel to the line y - 2 = 4(x + 1)?

Hint: Look for equations with the same slope.

◯ A) y - 3 = 4(x - 2)
◯ B) y + 2 = -4(x - 1)
◯ C) y = 4x + 1
◯ D) y - 2 = -4(x + 1)

Evaluate the following statements and select those that are true about lines in point-slope form. (Select all that apply)

Hint: Consider the properties of lines represented in point-slope form.

☐ A) Lines with the same slope are always parallel.
☐ B) Lines with opposite reciprocal slopes are perpendicular.
☐ C) The point-slope form can represent vertical lines.
☐ D) The point-slope form is useful for finding equations of lines given a point and a slope.

Create a real-world problem that involves finding the equation of a line using point-slope form. Solve the problem and explain your solution process.

Hint: Think about a scenario where you have a point and a slope.

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