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Writing Linear Equations Worksheet

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Part 1: Building a Foundation

What is the standard form of a linear equation?

Hint: Think about the general representation of linear equations.

○ $y = mx + b$
○ $Ax + By = C$
○ $y - y_1 = m(x - x_1)$
○ $x = my + b$

Which of the following are components of a linear equation in slope-intercept form?

Hint: Consider the elements that define the slope-intercept format.

☐ Slope
☐ Y-intercept
☐ X-intercept
☐ Quadratic term

Explain what the slope of a linear equation represents in the context of a graph.

Hint: Think about how the slope affects the angle of the line.

List the three common forms of linear equations.

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Hint: Consider the standard, slope-intercept, and point-slope forms.

1. What is the first form?

[   ]

2. What is the second form?

[   ]

3. What is the third form?

[   ]

Part 2: comprehension and Application

If a line has a slope of 2 and a y-intercept of -3, what is the equation of the line in slope-intercept form?

Hint: Use the slope-intercept formula y = mx + b.

○ y = 2x - 3
○ y = -3x + 2
○ y = 2x + 3
○ y = -2x - 3

Which of the following statements are true about the graph of a linear equation?

Hint: Consider the properties of linear graphs.

☐ It is always a straight line.
☐ The slope determines the steepness of the line.
☐ The y-intercept is where the line crosses the x-axis.
☐ The line can curve depending on the values of m and b.

Describe how you would convert a linear equation from point-slope form to slope-intercept form.

Hint: Think about the steps involved in rearranging the equation.

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Given the points (1, 2) and (3, 6), what is the slope of the line passing through these points?

Hint: Use the slope formula (y2 - y1) / (x2 - x1).

○ 2
○ 3
○ 4
○ 5

You are given a linear equation y = 4x + 1. Which of the following points lie on this line?

Hint: Substitute the x-values of the points into the equation to check.

☐ (0, 1)
☐ (1, 5)
☐ (2, 9)
☐ (3, 13)

Write the equation of a line in point-slope form that passes through the point (4, -2) with a slope of 3.

Hint: Use the point-slope formula y - y1 = m(x - x1).

Part 3: Analysis, Evaluation, and Creation

Which of the following changes will make the line y = 2x + 3 steeper?

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Hint: Consider how changing the slope affects the steepness.

◯ Changing the slope to 1
◯ Changing the slope to 3
◯ Changing the y-intercept to 5
◯ Changing the y-intercept to -3

Analyze the equation 3x + 4y = 12. Which of the following statements are true?

Hint: Consider the slope and intercepts of the equation.

☐ The slope is -3/4.
☐ The y-intercept is 3.
☐ The x-intercept is 4.
☐ The equation can be rewritten as y = -3/4x + 3.

Break down the process of finding the x-intercept of a linear equation given in standard form.

Hint: Think about setting y to zero in the equation.

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If a linear equation models the cost C in dollars of producing x items as C = 5x + 20, what does the y-intercept represent?

Hint: Consider what the fixed costs are in this scenario.

◯ The cost per item
◯ The total cost for 5 items
◯ The fixed cost regardless of the number of items
◯ The variable cost per item

Evaluate the following scenarios and identify which ones can be modeled by a linear equation:

Hint: Think about relationships that have a constant rate of change.

☐ The relationship between distance and time at constant speed.
☐ The growth of a population over time in a closed environment.
☐ The cost of buying apples at a fixed price per apple.

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☐ The area of a square as its side length increases.

Create a real-world problem that can be solved using a linear equation. Provide the equation and explain how it models the situation.

Hint: Think about a scenario involving a constant rate of change.

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