The Function G Is Defined By The Following Rule.g(x)=-3x+5Complete The Function Table.

The Function G Is Defined By The Following Rule.g(x)=-3x+5Complete The Function Table.

Understanding linear functions is a fundamental aspect of algebra, and one common task involves evaluating a given function at specific points and completing its corresponding table. In this article, we delve into the function $g(x) = -3x + 5$, exploring how to compute its values, complete its table, and understand its properties. Whether you're a student preparing for exams or someone interested in mastering algebraic functions, this comprehensive guide will provide the clarity and detailed explanation you need.

Introduction to the Function g(x) = -3x + 5

A linear function like $g(x) = -3x + 5$ describes a straight line when graphed on the coordinate plane. The function is in slope-intercept form, $y = mx + b$, where:

- m is the slope of the line
- b is the y-intercept

In $g(x) = -3x + 5$:

- Slope (m) = -3
- Y-intercept (b) = 5

This means the line crosses the y-axis at (0, 5) and decreases by 3 units vertically for every 1 unit increase horizontally.

Understanding the Components of the Function

Slope

The slope of -3 indicates the rate of change of g(x) with respect to x. Specifically, for each increase of 1 in x, the value of g(x) decreases by 3.

Y-Intercept

The y-intercept at 5 tells us that when x = 0, g(x) = 5. This point serves as a starting reference for plotting the line.

How to Complete the Function Table

Completing a function table involves calculating the value of g(x) for various x-values. This process is straightforward once you understand the function's rule.

Step-by-Step Process

1. Choose specific x-values to evaluate. These can be positive, negative, or zero.
2. Plug each x-value into the function g(x) = -3x + 5.
3. Simplify to find the corresponding g(x) value.
4. Record the (x, g(x)) pairs in the table.

Sample x-values

Common choices include -2, -1, 0, 1, 2, but you can select any values relevant to your study.

Completing the Function Table: Examples

Let's evaluate g(x) = -3x + 5 for specific x-values:

x-value	Calculation	g(x) value	Resulting Point (x, g(x))
-2	-3(-2) + 5	6 + 5	(-2, 11)
-1	-3(-1) + 5	3 + 5	(-1, 8)
0	-3(0) + 5	0 + 5	(0, 5)
1	-3(1) + 5	-3 + 5	(1, 2)
2	-3(2) + 5	-6 + 5	(2, -1)

By following this method, you can extend the table with more x-values as needed.

Interpreting the Function Table

The table provides a clear visualization of how g(x) behaves:

- As x increases, g(x) decreases, reflecting the negative slope.
- When x is negative, g(x) is positive and increases as x becomes more negative.
- The y-intercept at (0, 5) confirms the point where the line crosses the y-axis.

Graphing the Function g(x) = -3x + 5

Plotting the points from the completed table and drawing a straight line through them gives a visual understanding of the function's behavior.

Steps to Graph

1. Plot the points from the table:
- (-2, 11)
- (-1, 8)
- (0, 5)
- (1, 2)
- (2, -1)
2. Connect the points with a straight line.
3. Extend the line across the graph to represent all x-values.

Properties of the Function $g(x) = -3x + 5$

Understanding the properties of this linear function enhances comprehension:

Slope

- The slope is -3.
- Indicates the line is decreasing.
- For each unit increase in x, $g(x)$ decreases by 3.

Y-Intercept

- The y-intercept is 5.
- The point (0, 5) is where the line crosses the y-axis.

X-Intercept

- To find x-intercept, set $g(x) = 0$:

$$0 = -3x + 5$$

Solving for x:

$$-3x = -5$$

$$x = 5/3 \approx 1.67$$

- The x-intercept is approximately at (1.67, 0).

Applications of the Function g(x) = -3x + 5

Linear functions like g(x) are used in various real-world scenarios:

- Economics: Calculating profit or loss based on units sold.
- Physics: Describing linear motion with constant velocity.
- Business: Modeling revenue or cost functions.
- Statistics: Predicting outcomes based on linear relationships.

Practice Problems to Reinforce Learning

To solidify your understanding, try completing the following:

1. Calculate g(x) for x = -3, 3, and 4.
2. Find the x-intercept of g(x).
3. Plot the points and draw the line for x-values from -3 to 3.
4. Determine the slope's effect on the graph's direction.

Solutions:

1. For x = -3: g(-3) = -3(-3) + 5 = 9 + 5 = 14
- For x = 3: g(3) = -3(3) + 5 = -9 + 5 = -4
- For x = 4: g(4) = -3(4) + 5 = -12 + 5 = -7

2. X-intercept: 0 = -3x + 5 → x = 5/3 ≈ 1.67

3. Plot points: (-3, 14), (0, 5), (3, -4), (4, -7), then draw a straight line through them.

Conclusion: Mastering Linear Functions with g(x) = -3x + 5

The function g(x) = -3x + 5 exemplifies a simple yet powerful linear relationship. By understanding how to evaluate the function at various points, complete its table, and interpret its properties, students gain a strong foundation in algebra. Remember that the key steps involve choosing x-values, applying the function rule, and analyzing the resulting points to understand the function's behavior visually and conceptually.

This comprehensive approach not only helps in completing function tables but also prepares learners for more advanced topics such as graphing, analyzing slopes, and applying linear functions in real-world contexts. Practice regularly with different functions to develop confidence and proficiency in algebraic concepts.

Happy learning!

Frequently Asked Questions

What is the rule for the function G?

The rule for the function G is $G(x) = -3x + 5$.

How do you evaluate G(2)?

$G(2) = -3(2) + 5 = -6 + 5 = -1$.

What is G(0)?

$G(0) = -3(0) + 5 = 0 + 5 = 5$.

What is the value of G(-1)?

$G(-1) = -3(-1) + 5 = 3 + 5 = 8$.

Calculate G(4).

$G(4) = -3(4) + 5 = -12 + 5 = -7$.

What is the slope of the function G?

The slope of G is -3, indicating it decreases by 3 for each unit increase in x.

What is the y-intercept of the function G?

The y-intercept is 5, where the graph crosses the y-axis.

Complete the function table for G at x = -2, 0, 1, 3.

$G(-2) = -3(-2)+5=6+5=11$; $G(0)=5$; $G(1)=-3(1)+5=2$; $G(3)=-3(3)+5=-9+5=-4$.

How does the value of G change as x increases?

As x increases, G decreases by 3 for each increase of 1 in x, following the slope of -3.

Additional Resources

Comprehensive Analysis of the Function $G(x) = -3x + 5$ and Completing Its Function Table

Understanding linear functions is fundamental in algebra, serving as a cornerstone for more advanced mathematical concepts. The function $G(x) = -3x + 5$ exemplifies a linear relationship between the input variable x and the output $G(x)$. In this detailed review, we will explore the nature of this function, how to evaluate it for various values of x, and how to accurately complete its corresponding function table. We will also delve into the underlying principles that govern linear functions, interpret the significance of the slope and y-intercept, and provide practical methods for calculating G(x) for different x-values.

Introduction to the Function G(x) = -3x + 5

The function G(x) = -3x + 5 is a linear function, meaning its graph is a straight line when plotted on a coordinate plane. The general form of a linear function is:

$$ y = mx + b $$

where:
- m is the slope of the line,
- b is the y-intercept, the point where the line crosses the y-axis.

In our case:
- m = -3, indicating the line slopes downward from left to right,
- b = 5, meaning the line crosses the y-axis at the point (0, 5).

Key characteristics of G(x):
- The negative slope (-3) suggests that the function decreases as x increases.
- The y-intercept at (0, 5) serves as a starting point for plotting the line.

Understanding the Components of G(x) = -3x + 5

To fully grasp the behavior of this function and accurately complete its table, it's essential to understand its components:

Slope (m = -3)

- The slope determines the rate of change of G(x) concerning x.
- A slope of -3 means that for every increase of 1 in x, G(x) decreases by 3.
- Conversely, for every decrease of 1 in x, G(x) increases by 3.

Y-Intercept (b = 5)

- The y-intercept is the value of G(x) when x = 0.
- Here, G(0) = -3(0) + 5 = 5.
- This point, (0, 5), is vital for sketching the line and serves as a reference point.

Linearity and Graphical Representation

- The function's graph is a straight line passing through (0, 5).
- The slope indicates a downward trend, meaning the line descends as x increases.
- The line extends infinitely in both directions, representing all real x-values.

Evaluating G(x) for Specific Values of x

To complete the function table, we need to evaluate G(x) for specific x-values. Typically, this involves choosing a set of x-values—both positive and negative—to observe how G(x) responds.

Step-by-Step Calculation Method:

1. Substitute the chosen x-value into the function G(x) = -3x + 5.
2. Perform the multiplication (-3 times x).
3. Add 5 to the result.
4. Record the resulting G(x) value in the table.

Example Evaluations:

- For x = 0:
$$ G(0) = -3(0) + 5 = 0 + 5 = 5 $$
- For x = 1:
$$ G(1) = -3(1) + 5 = -3 + 5 = 2 $$
- For x = -1:
$$ G(-1) = -3(-1) + 5 = 3 + 5 = 8 $$
- For x = 2:
$$ G(2) = -3(2) + 5 = -6 + 5 = -1 $$
- For x = -2:
$$ G(-2) = -3(-2) + 5 = 6 + 5 = 11 $$

Using these calculations, we can systematically fill in the table for the selected x-values.

Constructing the Complete Function Table

Based on the above, here's a detailed example of a function table with multiple x-values and their corresponding G(x) values:

x	G(x) = -3x + 5
-3	G(-3) = -3(-3) + 5 = 9 + 5 = 14

-2	G(-2) = 6 + 5 = 11
-1	G(-1) = 3 + 5 = 8
0	G(0) = 0 + 5 = 5
1	G(1) = -3 + 5 = 2
2	G(2) = -6 + 5 = -1
3	G(3) = -9 + 5 = -4

This table illustrates how G(x) changes with x, reinforcing the concept of linearity and the significance of slope and intercept.

Graphical Interpretation and Visualization

Plotting the points from the table can vividly demonstrate the linear nature of the function:

- Plot the points (−3, 14), (−2, 11), (−1, 8), (0, 5), (1, 2), (2, -1), (3, -4).
- Draw a straight line through these points.
- The line will slope downward, consistent with the negative slope of -3.
- The y-intercept at (0, 5) serves as a key reference point.

Visualizing the graph helps in understanding the real-world implications of the function, such as how a quantity decreases at a constant rate as another increases.

Applications and Real-World Contexts

Linear functions like G(x) = -3x + 5 find applications across various fields:

- Economics: Modeling depreciation of assets, where value decreases at a constant rate.
- Physics: Describing deceleration in motion, where velocity decreases linearly over time.
- Business: Calculating profit or loss with linear relationships between units sold and revenue.
- Computer Science: Analyzing algorithms with linear time complexity.

Understanding how to evaluate and complete such tables is crucial for interpreting data, making predictions, and solving practical problems.

Advanced Considerations: Domain and Range

- Domain: Since G(x) is a linear function defined for all real numbers, the domain is \(\mathbb{R}\).
- Range: As x varies over all real numbers, G(x) also covers all real numbers because the line extends

infinitely in both directions.

In specific contexts, restrictions might be imposed, such as limiting x-values to positive integers, which would restrict the domain accordingly.

Summary and Key Takeaways

- The function $G(x) = -3x + 5$ is a classic linear function characterized by its slope (-3) and y-intercept (5).
- Completing its table involves straightforward substitution of chosen x-values into the function.
- The negative slope indicates a decreasing relationship between x and $G(x)$.
- Plotting the points from the table reveals a straight line with a downward trend.
- Recognizing the components of the function helps in predicting $G(x)$ for any x-value.
- Such functions are vital across many disciplines, illustrating the importance of mastering their evaluation and interpretation.

Conclusion

Mastering the evaluation of linear functions like $G(x) = -3x + 5$ and accurately completing their tables is essential for developing algebraic proficiency and analytical skills. By understanding the significance of the slope and y-intercept, practicing substitution for various x-values, and visualizing the graph, students and enthusiasts can deepen their comprehension of linear relationships. With this knowledge, you are equipped to analyze similar functions, interpret their behavior, and apply these concepts to real-world problems with confidence and clarity.

If you want to further enhance your understanding of linear functions, consider exploring how changing the slope or y-intercept affects the graph, or delve into solving equations involving linear functions for specific x-values.

The Function G Is Defined By The Following Rule G X 3x 5complete The Function Table

The Function G Is Defined By The Following Rule G X 3x 5complete The Function Table

Related Articles

- What Is The Theme Of Blu's Hanging? What Is One Way The Author Develops The Theme?
- What Decision Did The Saudi Government Make As A Result Of Husseins Attack On Kuwait?.
- What Happens If You Use Acid Alcohol As The Decolorizing Agent In Spore Staining?

Back to Home