

Identifying Functions Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What is the definition of a function?

Hint: Think about the relationship between inputs and outputs.

- A) A relation where each input is related to multiple outputs
- B) A relation where each input is related to exactly one output ✓
- C) A relation with no outputs
- D) A relation with multiple inputs and outputs

■ A function is defined as a relation where each input is related to exactly one output.

Which of the following are characteristics of a function?

Hint: Consider the properties that define a function.

- A) Each input has exactly one output ✓
- B) The graph passes the Vertical Line Test ✓
- C) Each output has exactly one input
- D) The graph can be crossed by a vertical line more than once

■ Characteristics of a function include that each input has exactly one output and the graph passes the Vertical Line Test.

Explain the Vertical Line Test and how it is used to determine if a graph represents a function.

Hint: Think about how vertical lines interact with the graph.

The Vertical Line Test states that if a vertical line intersects a graph at more than one point, then the graph does not represent a function.

List the types of functions mentioned in the key concepts.

Hint: Think about the different categories of functions.

1. What are linear functions?

Functions that create a straight line when graphed.

2. What are quadratic functions?

Functions that create a parabolic shape when graphed.

3. What are polynomial functions?

Functions that involve terms with variables raised to whole number powers.

Types of functions may include linear, quadratic, polynomial, rational, and exponential functions.

Part 2: Comprehension and Application

What is the domain of a function?

Hint: Consider what values can be input into a function.

- A) The set of all possible outputs
- B) The set of all possible inputs ✓
- C) The set of all possible variables
- D) The set of all possible constants

■ The domain of a function is the set of all possible inputs.

Which of the following are true about linear functions?

Hint: Think about the characteristics of linear functions.

- A) They form a straight line on a graph ✓
- B) They have the form $y = mx + b$ ✓
- C) They form a V-shaped curve
- D) They represent exponential growth

■ Linear functions form a straight line on a graph and have the form $y = mx + b$.

Describe the difference between the domain and range of a function with an example.

Hint: Think about inputs versus outputs.

■ The domain refers to the set of possible inputs, while the range refers to the set of possible outputs. For example, in the function $f(x) = x^2$, the domain is all real numbers, and the range is all non-negative real numbers.

Given the function $f(x) = 2x + 3$, what is $f(4)$?

Hint: Substitute 4 into the function.

- A) 11 ✓
- B) 8
- C) 10
- D) 9

To find $f(4)$, substitute 4 into the function to get $f(4) = 2(4) + 3 = 11$.

Identify which of the following graphs represent a function.

Hint: Consider the Vertical Line Test for each graph.

- A) A graph of a straight line ✓
- B) A graph of a circle
- C) A graph of a parabola ✓
- D) A graph of a V-shaped curve ✓

A graph represents a function if it passes the Vertical Line Test. The straight line, parabola, and V-shaped curve represent functions, while the circle does not.

Given the quadratic function $y = x^2 - 4x + 4$, find the vertex of the parabola.

Hint: Use the vertex formula or complete the square.

The vertex of the parabola $y = x^2 - 4x + 4$ is at the point (2, 0).

Part 3: Analysis, Evaluation, and Creation

If a function $f(x)$ has an inverse, what must be true about its graph?

Hint: Consider the properties of functions with inverses.

- A) It must be a straight line
- B) It must pass the Horizontal Line Test ✓
- C) It must be a parabola
- D) It must have no intercepts

If a function has an inverse, its graph must pass the Horizontal Line Test.

Analyze the function $y = |x|$. Which of the following are true?

Hint: Think about the shape and properties of the graph.

- A) It is a linear function
- B) It forms a V-shaped graph ✓
- C) It has a vertex at the origin ✓
- D) It is not a function

■ The function $y = |x|$ forms a V-shaped graph and has a vertex at the origin.

Compare and contrast linear and quadratic functions in terms of their graphs and equations.

Hint: Think about the shapes and forms of their equations.

■ Linear functions have straight-line graphs and are represented by equations of the form $y = mx + b$, while quadratic functions have parabolic graphs and are represented by equations of the form $y = ax^2 + bx + c$.

Which of the following statements is true about inverse functions?

Hint: Consider the relationship between a function and its inverse.

- A) They do not exist for linear functions
- B) They reverse the operation of the original function ✓
- C) They have the same graph as the original function
- D) They are always quadratic

■ Inverse functions reverse the operation of the original function.

Evaluate the following scenarios and determine which can be represented by a function.

Hint: Think about the relationships between the variables.

- A) The relationship between temperature and time of day ✓

- B) The relationship between a person's age and height ✓
- C) The relationship between distance and time for a constant speed ✓
- D) The relationship between a book's title and its author

The relationships that can be represented by a function include the relationship between temperature and time of day, a person's age and height, and distance and time for a constant speed.

Create a real-world scenario where a quadratic function could be used to model the situation. Explain why a quadratic function is appropriate.

Hint: Think about situations involving area or projectile motion.

A quadratic function could model the height of a ball thrown into the air over time, as the height will increase to a maximum point and then decrease, forming a parabola.