Function Domain Range Graph 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 has exactly one output ✓**
- ◯ b) A set of ordered pairs
- ◯ c) A graph with no intercepts
- ◯ d) A calculation involving variables

> A function is defined as a relation where each input has exactly one output.

Which of the following are examples of domains?

Hint: Consider the possible values for the input of a function.

- ☐ **a) All real numbers ✓**
- ☐ **b) $x \geq 0$ ✓**
- ☐ c) $y \leq 5$
- ☐ **d) $x \neq 2$ ✓**

> Examples of domains include all real numbers, $x \geq 0$, and $x \neq 2$.

Explain in your own words what the range of a function represents.

Hint: Think about the possible outputs of a function.

The range of a function represents all possible output values that the function can produce.

List two types of functions and describe their general graph shapes.

Hint: Consider common functions you have learned about.

1. Type of function 1

Linear function

2. Description of graph shape 1

Straight line

3. Type of function 2

Quadratic function

4. Description of graph shape 2

Parabola

Examples include linear functions (straight line) and quadratic functions (parabola).

Part 2: Understanding and Interpretation

What does the graph of a linear function typically look like?

Hint: Consider the shape of the graph when plotted.

- ◯ a) A curve
- ◯ **b) A straight line ✓**
- ◯ c) A circle
- ◯ d) A parabola

> The graph of a linear function typically looks like a straight line.

When analyzing a graph, which features help determine the range?

Hint: Think about the key points on the graph.

- ☐ **a) Intercepts ✓**
- ☐ **b) Maximum and minimum points ✓**
- ☐ **c) Asymptotes ✓**
- ☐ d) Slope

> Features such as maximum and minimum points, and intercepts help determine the range.

Describe how you would find the domain of a function given its equation.

Hint: Consider the restrictions on the input values.

> **To find the domain, identify any restrictions on the input values from the equation.**

Part 3: Application and Analysis

Given the function $f(x) = x^2$, what is the domain?

Hint: Think about the possible values for x.

- ◯ a) $x > 0$
- ◯ b) $x < 0$
- ◯ **c) All real numbers ✓**
- ◯ d) $x \neq 0$

The domain of $f(x) = x^2$ is all real numbers.

For the function $g(x) = \sqrt{x}$, which of the following are true about its domain?

Hint: Consider the values of x that make the function valid.

- ☐ **a) $x \geq 0$ ✓**
- ☐ b) $x > 0$
- ☐ c) $x \leq 0$
- ☐ d) $x \neq -1$

The domain of $g(x) = \sqrt{x}$ is $x \geq 0$.

Sketch the graph of the function $h(x) = 2x + 3$ and identify its domain and range.

Hint: Consider the slope and y-intercept for the graph.

The graph is a straight line with a domain of all real numbers and a range of all real numbers.

Part 4: Evaluation and Creation

Which of the following transformations will affect the range of a function?

Hint: Think about how transformations change the output values.

- ◯ a) Horizontal shift
- ◯ **b) Vertical shift ✓**
- ◯ c) Reflection over the y-axis
- ◯ d) Rotation

> A vertical shift will affect the range of a function.

When analyzing a quadratic function, which aspects are crucial for determining its range?

Hint: Consider the key features of a quadratic graph.

- ☐ **a) Vertex ✓**
- ☐ **b) Axis of symmetry ✓**
- ☐ **c) Direction of opening (up or down) ✓**
- ☐ d) Intercepts

> Aspects such as the vertex, direction of opening, and axis of symmetry are crucial for determining the range.

Analyze the function $f(x) = -x^2 + 4x + 1$. Determine its vertex and explain how it affects the range.

Hint: Use the vertex formula to find the vertex.

> **The vertex can be found using the formula, and it affects the range by determining the maximum or minimum value.**

If a function's graph passes the vertical line test, what can be concluded?

Hint: Consider the definition of a function.

- ◯ a) It is not a function
- ◯ **b) It is a function ✓**
- ◯ c) It has no domain
- ◯ d) It has no range

If a graph passes the vertical line test, it can be concluded that it is a function.

Which scenarios indicate a function is not one-to-one?

Hint: Think about the characteristics of one-to-one functions.

- [ ] **a) Two different inputs have the same output ✓**
- [ ] **b) The graph fails the horizontal line test ✓**
- [ ] c) The graph is a straight line
- [ ] **d) The function is quadratic ✓**

Scenarios such as two different inputs having the same output indicate a function is not one-to-one.

Create a real-world scenario where determining the domain and range of a function is necessary. Explain the steps you would take to find them.

Hint: Think about practical applications of functions.

A real-world scenario could involve a business model, and steps would include identifying constraints and possible outputs.