Function Domain Range Graph Worksheet

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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

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) $x \neq 2$

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

Hint: Think about the possible outputs of a function.

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

Hint: Consider common functions you have learned about.

1. Type of function 1

2. Description of graph shape 1

3. Type of function 2

4. Description of graph shape 2

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

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

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

Hint: Consider the restrictions on the input values.

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) $x \neq 0$

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) $x \neq -1$

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.

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

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

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.

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

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

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.