

Domain And Range Of A Function Graph Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What is the domain of a function?

Hint: Think about what values you can input into a function.

- A) The set of all possible output values
- B) The set of all possible input values ✓
- C) The set of all positive values
- D) The set of all negative values

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

Which of the following statements are true about the range of a function? (Select all that apply)

Hint: Consider what values the function can output.

- A) It includes all y-values that the function can produce. ✓
- B) It is always a set of positive numbers.
- C) It can be determined by looking at the graph of the function. ✓
- D) It is the same as the domain.

■ The range includes all y-values that the function can produce and can be determined from the graph.

Explain in your own words the difference between the domain and range of a function.

Hint: Think about inputs versus outputs.

The domain refers to the inputs of the function, while the range refers to the outputs.

List two types of functions and describe their general shape on a graph.

Hint: Think about common functions you have learned.

1. Type of function 1

Linear function

2. Description of shape

Straight line

3. Type of function 2

Quadratic function

4. Description of shape

Parabola

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

Part 2: Comprehension and Application

Which feature of a graph helps identify the domain of a function?

Hint: Consider the lines and points on the graph.

- A) Horizontal asymptotes
- B) Vertical asymptotes ✓
- C) Intercepts
- D) Maximum points

Vertical asymptotes can indicate restrictions in the domain.

What are common restrictions on the domain of a function? (Select all that apply)

Hint: Think about operations that can limit input values.

- A) Division by zero ✓
- B) Negative square roots ✓
- C) Exponential growth
- D) Linear transformations

Common restrictions include division by zero and negative square roots.

Describe how the graph of a quadratic function can help you determine its range.

Hint: Consider the vertex and direction of the parabola.

The vertex indicates the minimum or maximum value, which helps define the range.

If a function is defined as $f(x) = \frac{1}{x-2}$, what is the domain of this function?

Hint: Consider what value would make the denominator zero.

- A) All real numbers

- B) All real numbers except 2 ✓
- C) All positive numbers
- D) All negative numbers

■ The domain is all real numbers except 2, as it would make the function undefined.

Given the function $g(x) = \sqrt{x+3}$, which of the following x-values are in the domain? (Select all that apply)

Hint: Consider what values make the expression under the square root non-negative.

- A) -4 ✓
- B) -3 ✓
- C) 0 ✓
- D) 3 ✓

■ The domain includes x-values that make the expression under the square root non-negative.

Provide a real-world example where understanding the domain and range of a function is crucial, and explain why.

Hint: Think about situations where limits are important.

■ An example could be a function representing the height of a projectile, where the domain is time and the range is height.

Part 3: Analysis, Evaluation, and Creation

How does a vertical shift in a function's graph affect its range?

Hint: Consider how moving the graph up or down changes the output values.

- A) It increases the domain.
- B) It decreases the domain.

- C) It shifts the range up or down. ✓
 D) It does not affect the range.

■ A vertical shift will shift the range up or down, depending on the direction of the shift.

Analyze the function $h(x) = x^2 - 4x + 3$. Which of the following statements are true? (Select all that apply)

Hint: Consider the characteristics of quadratic functions.

- A) The domain is all real numbers. ✓
 B) The range is all real numbers.
 C) The graph is a parabola. ✓
 D) The vertex affects the range. ✓

■ The domain is all real numbers, the graph is a parabola, and the vertex affects the range.

Examine the function $f(x) = \frac{x^2 - 1}{x + 1}$. Discuss any points of discontinuity and their impact on the domain.

Hint: Consider where the function is undefined.

■ The function is discontinuous at $x = -1$, which affects the domain.

Which of the following functions has the largest range?

Hint: Consider the output values of each function.

- A) $f(x) = x^2$
 B) $g(x) = \sin(x)$ ✓
 C) $h(x) = e^x$
 D) $j(x) = \log(x)$

■ The function $g(x) = \sin(x)$ has a range of $[-1, 1]$, while others have more limited ranges.

Evaluate the following scenarios and determine which could affect the range of a function. (Select all that apply)

Hint: Think about transformations and their effects on output values.

- A) Horizontal stretch ✓
- B) Vertical compression ✓
- C) Reflection over the x-axis ✓
- D) Adding a constant to the function ✓

Horizontal stretches, vertical compressions, reflections, and adding constants can all affect the range.

Design a function that has a domain of all real numbers except -2 and a range of all real numbers greater than 0. Explain your reasoning.

Hint: Consider how to create a function with these properties.

An example could be $f(x) = \frac{1}{x+2}$, which is undefined at -2 and outputs positive values.

Create a scenario where understanding the domain and range is essential, and describe how you would determine these for the function involved.

Hint: Think about real-world applications of functions.

1. Scenario description

Profit based on sales

2. Domain determination

| Number of items sold

3. Range determination

| Profit earned

| An example could be a function representing profit based on sales, where the domain is the number of items sold and the range is profit.