Domain And Range Of A Function 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 describes the range of a function?

Hint: Consider what values come out of a function.

- ◯ A) The set of all possible input values
- ◯ **B) The set of all possible output values ✓**
- ◯ C) The set of all x-values
- ◯ D) The set of all y-values

> The range of a function is the set of all possible output values.

Which of the following functions have a domain of all real numbers? (Select all that apply)

Hint: Think about the types of functions and their restrictions.

- ☐ **A) Linear functions ✓**
- ☐ **B) Quadratic functions ✓**
- ☐ C) Rational functions
- ☐ D) Radical functions

Linear and quadratic functions have a domain of all real numbers.

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

Hint: Consider what each term refers to in relation to a function.

The domain refers to input values, while the range refers to output values.

List two types of functions and describe their typical domain and range.

Hint: Think about common functions you have encountered.

1. Type of function 1

Linear function: Domain is all real numbers, range is all real numbers.

2. Type of function 2

Quadratic function: Domain is all real numbers, range is non-negative real numbers.

Linear functions typically have a domain and range of all real numbers, while quadratic functions have a domain of all real numbers and a range of non-negative real numbers.

Part 2: Understanding and Interpretation

What is the range of the function $f(x) = x^2$?

Hint: Consider the output values of the function as x varies.

- ◯ A) All real numbers
- ◯ B) All positive real numbers
- ◯ **C) All non-negative real numbers ✓**
- ◯ D) All negative real numbers

> The range of f(x) = x² is all non-negative real numbers.

Which of the following statements are true about the domain of the function f(x) = 1/(x-2)? (Select all that apply)

Hint: Think about values that would make the function undefined.

- ☐ A) The domain includes x = 2
- ☐ **B) The domain excludes x = 2 ✓**
- ☐ **C) The domain is all real numbers except x = 2 ✓**
- ☐ D) The domain is all real numbers

> The domain excludes x = 2 and is all real numbers except x = 2.

Describe how you would determine the domain of a radical function such as f(x) = √(x-3).

Hint: Consider the values that make the expression under the radical non-negative.

> **To determine the domain, set the expression under the radical greater than or equal to zero and solve for x.**

Part 3: Application and Analysis

Given the function f(x) = 3x + 5, what is the range if the domain is restricted to x ≥ 0?

Hint: Consider how the function behaves with the given restriction.

- ◯ **A) $y \geq 5$ ✓**
- ◯ B) $y \leq 5$
- ◯ C) $y \geq 0$
- ◯ D) $y \leq 0$

> The range is $y \geq 5$ when the domain is restricted to $x \geq 0$.

If a quadratic function opens downwards and has a vertex at (2, 3), which of the following are true about its range? (Select all that apply)

Hint: Consider the implications of the vertex on the range.

- ☐ **A) The range is $y \leq 3$ ✓**
- ☐ B) The range is $y \geq 3$
- ☐ C) The range is all real numbers
- ☐ **D) The range is limited by the vertex ✓**

> The range is $y \leq 3$ since the vertex is the maximum point.

Consider a real-world scenario where a function models the height of a ball thrown into the air. Explain how you would determine the domain and range of this function.

Hint: Think about the physical constraints of the scenario.

> **The domain would be the time interval during which the ball is in the air, and the range would be the height values from the ground to the maximum height.**

Part 4: Evaluation and Creation

Analyze the function $f(x) = 1/(x^2 - 4)$. What values must be excluded from the domain?

Hint: Consider the values that make the denominator zero.

- ◯ **A) $x = 2$ and $x = -2$ ✓**

- ◯ B) x = 0
- ◯ C) x = 4
- ◯ D) x = -4

> The values x = 2 and x = -2 must be excluded from the domain.

For the function f(x) = √(x + 1), which of the following statements are true? (Select all that apply)

Hint: Think about the values that make the expression under the radical non-negative.

- ☐ **A) The domain is x ≥ -1 ✓**
- ☐ **B) The range is y ≥ 0 ✓**
- ☐ C) The domain is all real numbers
- ☐ D) The range is all real numbers

> The domain is x ≥ -1 and the range is y ≥ 0.

Given the function f(x) = x² - 4x + 3, factor it and determine the domain and range by analyzing its graph.

Hint: Consider how to factor the quadratic and what the graph looks like.

> **The function factors to (x-1)(x-3) and has a domain of all real numbers and a range of non-negative real numbers.**

Evaluate the following statement: "The domain of a function is always the same as its range." Is this statement true or false?

Hint: Consider the definitions of domain and range.

- ◯ A) True
- ◯ **B) False ✓**
- ◯ C) Sometimes true
- ◯ D) Always true

> The statement is false; the domain and range are generally different.

Which of the following scenarios would require you to restrict the domain of a function? (Select all that apply)

Hint: Think about real-world situations where certain inputs are not possible.

- [x] **A) A function modeling the number of people in a room ✓**
- [ ] B) A function representing the temperature over time
- [ ] C) A function calculating the speed of a car
- [x] **D) A function determining the area of a square ✓**

> Scenarios like modeling the number of people in a room or the area of a square would require domain restrictions.

Create a real-world problem that involves determining the domain and range of a function. Provide a brief explanation of how you would solve it.

Hint: Think about a situation where you can model something with a function.

> **An example could be modeling the distance a car travels over time, where the domain is time and the range is distance.**