domain and range quadratic Complete Guide

Domain and Range Quadratic

Understanding the concepts of domain and range is fundamental in the study of quadratic functions. These two mathematical terms describe the set of possible input values (domain) and output values (range) for a quadratic equation. Mastery of how to determine the domain and range of quadratic functions is essential for students and professionals working in mathematics, engineering, physics, and related fields. This comprehensive guide aims to clarify these concepts, explain their significance, and provide step-by-step methods for identifying the domain and range of quadratic functions.

What Is a Quadratic Function?

Before diving into domain and range, it?s important to understand what a quadratic function is.

Definition of a Quadratic Function

A quadratic function is a polynomial function of degree 2, typically written in the form:

$$
f(x) = ax^2 + bx + c
$$

where:

- a, b, and c are constants,
- $a \neq 0$,
- x is a real number variable.

Key features of quadratic functions include:

- Parabolic graphs opening upwards or downwards depending on the sign of a,
- A vertex point representing the maximum or minimum value,
- Symmetry about a vertical line called the axis of symmetry.

Understanding Domain and Range

What Is the Domain?

The domain refers to the set of all possible input values \(x\) for which the quadratic function is defined.

What Is the Range?

The range is the set of all possible output values \(f(x)\) that the function can produce based on its domain.

Importance of Domain and Range:

- They help in graphing the function accurately.
- They are essential in solving real-world problems, such as projectile motion, where input and output constraints exist.
- Understanding the domain and range is crucial for calculus, optimization, and other advanced topics.

Determining the Domain of a Quadratic Function

General Rule for Quadratic Functions

Since quadratic functions are polynomials, they are defined for all real numbers unless specified otherwise.

Therefore, the domain of most quadratic functions is:

\[

\boxed{(-\infty, \infty)}

\]

which means all real numbers.

Exceptions and Domain Restrictions

In some cases, quadratic functions may be part of a more complex expression or involve square roots, denominators, or other operations that restrict the domain.

Examples of restrictions:

- Division by zero (e.g., $f(x) = \frac{1}{x^2 + 1}$) ? here, the quadratic is defined everywhere because the denominator is never zero.
- Square root of a quadratic (e.g., $f(x) = \sqrt{ax^2 + bx + c}$) ? the expression inside the square root must be non-negative.

Summary of determining the domain:

- For standard quadratic functions in the form $ax^2 + bx + c$, the domain is all real numbers.
- For quadratic expressions involving square roots or denominators, set the expression within the root ? 0 or denominator ? 0 and solve for x.

Determining the Range of a Quadratic Function

Unlike the domain, the range of a quadratic function depends on the orientation of its parabola, which is determined by the coefficient a.

Step 1: Identify the Vertex

The vertex of a parabola is the highest or lowest point on the graph, which helps determine the maximum or minimum value of the function.

Vertex form of a quadratic:

$$
f(x) = a(x - h)^2 + k
$$

where (h, k) is the vertex.

Finding the vertex from standard form $ax^2 + bx + c$:

\[

h = -\frac{b}{2a}

\]

\[

k = f(h) = a h^2 + b h + c

\]

Procedure:

- Compute \(h\) using the formula above.
- Substitute \(h\) back into the function to find \(k\).

Step 2: Determine the Opening of the Parabola

- If \(a > 0\), the parabola opens upward, and the vertex is the minimum point.
- If \(a

Step 3: Establish the Range

- For upward-opening parabola (\(a > 0\)):

\[

\text{Range} = [k, \infty)

\]

- For downward-opening parabola (\(a

\[

\text{Range} = (-\infty, k]

\]

Example:

Given $f(x) = 2x^2 - 4x + 1$,

- Compute $h = -\frac{-4}{2 \times 2} = \frac{4}{4} = 1$,
- Find $k = f(1) = 2(1)^2 - 4(1) + 1 = 2 - 4 + 1 = -1$,
- Since $a = 2 > 0$, the parabola opens upward,

Therefore, the range is:

$$
[-1, \infty)
$$

Graphical Approach to Domain and Range

Visualizing the graph helps reinforce understanding of the domain and range.

Plotting the Parabola

- Identify the vertex using the calculations above.
- Determine the direction of the parabola based on the sign of a.
- Draw the axis of symmetry and plot additional points if needed.

Reading the Domain and Range from the Graph

- Domain: Since the parabola extends infinitely left and right, the domain is all real numbers.
- Range: Read the minimum or maximum point (vertex) to determine the output values the function attains.

Real-World Applications of Domain and Range in Quadratic Functions

Understanding the domain and range of quadratic functions is vital in various fields.

Physics and Engineering

- Modeling projectile motion where height depends on time, which involves quadratic functions.
- Designing parabolic reflectors and antennas, where the range determines the intensity distribution.

Economics and Business

- Analyzing profit functions that are quadratic in nature to find maximum profit (vertex) and feasible sales ranges.

Biology and Medicine

- Modeling growth rates or decay which can sometimes involve quadratic relationships within specific input ranges.

Practice Problems

Test your understanding with these problems:

- Find the domain and range of $f(x) = -3x^2 + 6x - 2$.
- Determine the domain and range of $f(x) = \sqrt{2x^2 - 8x + 10}$.

- Given $f(x) = \frac{1}{x^2 - 4}$, find the domain and describe the range.
- Sketch the graph of $f(x) = x^2 - 4x + 3$ and identify its domain and range.

Summary

- The domain of a quadratic function $ax^2 + bx + c$ is typically all real numbers unless restrictions are introduced by other operations like square roots or division.
- The range depends on the coefficient a and the vertex's k-value; upward-opening parabolas have a minimum value, downward-opening parabolas have a maximum.
- Finding the vertex is key to determining the range.
- Graphical interpretation aids in understanding the behavior of quadratic functions.

Mastering the concepts of domain and range in quadratic functions enhances problem-solving skills and provides insight into the practical applications of mathematics in various scientific and engineering disciplines.

Domain and Range Quadratic: Unlocking the Secrets of Parabolic Functions

The concept of domain and range quadratic is fundamental to understanding how quadratic functions behave and how they are applied across various fields such as mathematics, physics, engineering, and economics. These two properties?domain and range?serve as the foundation for analyzing the scope and output of quadratic functions, which are characterized by their distinctive parabolic graphs. As essential components of algebra and calculus, grasping the intricacies of these concepts enables students, educators, and professionals to interpret real-world phenomena with precision and confidence.

In this article, we will explore the nature of quadratic functions, delve into what domain and range signify within this context, and discuss methods to determine these properties. Whether you?re a student seeking clarity or a professional applying quadratic models in your work, understanding domain and range will enhance your ability to analyze and interpret a wide array of problems.

Understanding Quadratic Functions

Before diving into the specifics of domain and range, it?s crucial to establish a clear understanding of what quadratic functions are and how they behave.

What Is a Quadratic Function?

A quadratic function is a polynomial function of degree two, generally expressed in the form:

$f(x) = ax^2 + bx + c$

where:

- a, b, and c are constants with a ? 0.
- x is the independent variable.

The graph of a quadratic function is a parabola, which can open upward (if $a > 0$) or downward (if a
Key Features of Quadratic Functions

Quadratic functions possess several defining features that influence their domain and range:

- Vertex: The highest or lowest point on the parabola.
- Axis of symmetry: A vertical line that passes through the vertex, dividing the parabola into mirror

images.

- Direction of opening: Upward or downward, determined by the sign of a.
- Intercepts: Points where the parabola crosses the axes.

These features are interconnected with the function?s domain and range, shaping the scope of x and f(x) values the function can take.

The Domain of Quadratic Functions

Definition of Domain

The domain of a function is the set of all possible input values (x) for which the function is defined. For quadratic functions, the domain typically encompasses all real numbers, but understanding why is essential.

Domain of a Quadratic Function

Since quadratic functions are polynomial functions, they are defined for every real number. There are no restrictions like division by zero or square roots of negative numbers that limit the input values.

Therefore:

The domain of any quadratic function is all real numbers.

Expressed mathematically:

Domain: (-?, +?)

Why Is the Domain Always All Real Numbers?

Quadratic functions are continuous and defined for all real x. Polynomial expressions do not have undefined points or discontinuities, unlike rational functions or those involving roots of negative numbers.

In practical terms:

- No matter what real value you substitute into x, the quadratic formula will produce a real output.
- This universality makes quadratic functions versatile in modeling scenarios where input variables can take any real value.

Special Cases and Considerations

Although the standard quadratic function has a domain of all real numbers, some variations or transformations might impose restrictions:

- Quadratic functions with domain restrictions: Although rare, functions involving real-world constraints (e.g., x must be positive) may limit the domain.
- Composite functions: When quadratic functions are part of more complex expressions, domain restrictions might emerge from other components.

In general, understanding that the basic quadratic function?s domain is all real numbers provides a solid foundation for exploring their range and applications.

The Range of Quadratic Functions

Definition of Range

The range of a function is the set of all possible output values (f(x)) it can produce. Unlike the domain, which is often straightforward for quadratic functions, the range depends on the parabola?s orientation and position.

How to Determine the Range

Finding the range involves analyzing the vertex and the parabola?s opening direction.

Step 1: Identify the Vertex

The vertex provides the maximum or minimum value of the quadratic function.

- For a quadratic in standard form:

$f(x) = ax^2 + bx + c$

- The x-coordinate of the vertex is:

$x_v = -b / (2a)$

- The y-coordinate (value at the vertex):

$f(x_v) = a(x_v)^2 + bx_v + c$

Step 2: Determine the Opening Direction

- If $a > 0$, the parabola opens upward; the vertex is the minimum point.
- If a

Step 3: State the Range

- If the parabola opens upward ($a > 0$):

Range: [f(x_v), +?)

- If the parabola opens downward (a

Range: (-?, f(x_v)]

Examples

Example 1:

Given $f(x) = 2x^2 - 4x + 1$:

- $a = 2$, $b = -4$, $c = 1$
- $x_v = -(-4) / (22) = 4 / 4 = 1$
- $f(1) = 2(1)^2 - 4(1) + 1 = 2 - 4 + 1 = -1$
- Since $a > 0$, the parabola opens upward, and the range is [-1, +?).

Example 2:

Given $f(x) = -3x^2 + 6x - 2$:

- $a = -3$, $b = 6$, $c = -2$
- $x_v = -6 / (2 -3) = -6 / -6 = 1$

- $f(1) = -3(1)^2 + 6(1) - 2 = -3 + 6 - 2 = 1$
- Since a

Visualizing Domain and Range: The Parabola

Graphical representation is vital to understanding the domain and range intuitively.

The Parabola?s Shape and Its Implications

- The parabola extends infinitely along the x-axis, confirming the domain is all real numbers.
- The y-values are bounded above or below depending on the parabola?s opening direction, defining the range.

Interpreting the Graph

- The vertex indicates the extremum (minimum or maximum).
- The parabola?s arms extend infinitely, but the y-values are constrained to a particular interval.
- The axis of symmetry helps locate the vertex and understand the parabola?s symmetry.

Visual tools and graphing calculators enable learners and professionals to verify the domain and range visually and to identify these properties more effortlessly.

Applications of Domain and Range in Real-World Contexts

Understanding the domain and range of quadratic functions is not merely an academic exercise; it has practical implications across disciplines.

Physics and Engineering

- Projectile motion: The height of a projectile over time is modeled by a quadratic function. The domain might be limited to the duration of flight, while the range is the maximum height achieved.
- Structural analysis: Parabolic arches have specific load-bearing limits, translating into ranges of stress or strain.

Economics and Business

- Profit models: Quadratic functions can model profit or cost functions where the domain is constrained by production capabilities, and the range indicates potential profit or loss.

Environmental Science

- Population modeling: Certain growth models can be quadratic, with domain restrictions based on environmental factors and range indicating possible population sizes.

Summary and Key Takeaways

- The domain of quadratic functions is always all real numbers, owing to their polynomial nature and continuous definition.
- The range depends on the parabola?s vertex and opening direction, representing the set of all f(x) values the function can output.
- Determining the range involves calculating the vertex and analyzing whether the parabola opens upward or downward.
- Visualizing the graph of the quadratic function aids in understanding and verifying domain and range properties.
- Mastery of these concepts enhances problem-solving skills and the ability to interpret quadratic models in various real-world scenarios.

Final Thoughts

The exploration of domain and range quadratic functions reveals the elegance of mathematical relationships and their practical significance. Recognizing that the domain generally encompasses all real numbers simplifies initial analyses, while understanding the range offers insights into what outputs are achievable within specific models. As quadratic functions underpin numerous scientific and economic applications, a thorough grasp of their domain and range equips learners and professionals alike with vital tools to analyze, predict, and optimize real-world systems.

By mastering these foundational concepts, you are better prepared to navigate the complexities of algebra, calculus, and beyond?unlocking the full potential of quadratic functions in both theoretical and applied contexts.

QuestionAnswer What is the domain of a quadratic function? The domain of a quadratic function is all real numbers, since quadratic functions are defined for every real input. How do you find the range of a quadratic function? The range depends on the parabola's vertex and orientation; if it opens upward, the range is all values greater than or equal to the vertex's y-coordinate; if downward, it's all values less than or equal to the vertex's y-coordinate. What role does the vertex play in determining the range of a quadratic function? The vertex provides the minimum or maximum value of the quadratic, which helps identify the range; for an upward-opening parabola, the y-coordinate of the vertex is the lowest point, and vice versa. How can I determine the domain and range from the quadratic's equation in standard form? The domain is always all real numbers for a quadratic in standard form, while the range can be found by identifying the vertex and the parabola's opening direction. Why is the domain of a quadratic function always all real numbers? Because quadratic functions are polynomial functions of degree 2, which are defined for every real number input, making the domain all real numbers. How does the axis of symmetry relate to the range of a quadratic function? The axis of symmetry passes through the vertex, which determines the minimum or maximum value, thus helping to establish the range of the function. Can the domain and range of a quadratic function be limited? In the standard case, the domain is all real numbers, but if the quadratic is restricted or part of a piecewise function, the domain and range can be limited accordingly.

Related keywords: quadratic function, parabola, vertex, parabola graph, quadratic equation, quadratic formula, parabola domain, parabola range, quadratic graph, quadratic analysis

Domain And Range From Graph Multiple Choice

Domain and range from graph multiple choice questions are essential tools in understanding the fundamental concepts of functions in mathematics. These questions help students and learners evaluate their ability to interpret graphs accurately and determine the set of possible inputs (domain) and outputs (range) of a function. Mastering this skill is crucial for progressing in algebra, calculus, and other advanced mathematical topics. In this article, we will explore the concepts of domain and range, how to identify them from graphs, and strategies for answering multiple-choice questions effectively.

Understanding the Domain and Range of a Function

What is the Domain?

The domain of a function is the complete set of all possible input values (usually represented by the variable x) for which the function is defined. In graphical terms, it corresponds to all the x-values that have at least one corresponding y-value on the graph.

What is the Range?

The range of a function is the set of all possible output values (usually represented by y) that the function can produce. Graphically, it includes all the y-values that the graph attains for the x-values in the domain.

Why are Domain and Range Important?

Understanding the domain and range is fundamental for:

- Identifying the behavior of functions
- Graphing functions accurately
- Solving equations and inequalities
- Applying functions to real-world problems

How to Determine Domain and Range from Graphs

Steps to Find the Domain

- Look at the graph horizontally to identify all x-values where the graph exists.
- Check for all the x-values over which the graph extends or is continuous.
- Note any restrictions, such as gaps, holes, or vertical asymptotes, which may limit the domain.

Steps to Find the Range

- Observe the vertical extent of the graph.
- Identify the lowest and highest y-values that the graph attains.
- Consider any restrictions, such as gaps or asymptotes that limit the y-values.

Common Graph Features Affecting Domain and Range

- **Vertical lines:** A vertical line intersecting the graph at more than one point indicates a non-function; in functions, vertical lines should only intersect once.
- **Holes and gaps:** These can restrict the domain or range
- **Asymptotes:** Vertical asymptotes restrict the domain, while horizontal asymptotes influence the range.
- **Boundedness:** If the graph is bounded above or below, it affects the range accordingly.

Multiple Choice Questions on Domain and Range from Graphs

Typical Structure of Questions

Multiple-choice questions often present a graph accompanied by several options for the domain and range. The task is to select the correct set(s) based on the graph.

Example Question:

Given the graph below, select the correct domain and range.

Options:

a) Domain: [-3, 2], Range: [0, 5]

b) Domain: (-?, ?), Range: (-?, ?)

c) Domain: [1, 4], Range: [2, 6]

d) Domain: [0, 3], Range: [1, 4]

Answer: Based on the graph, the student must analyze the x-values and y-values the graph covers to choose the correct option.

Strategies for Answering Multiple Choice Questions Effectively

- **Visual Inspection:** Carefully observe the graph for the extremities of the curve.
- **Identify key points:** Find the minimum and maximum points vertically and horizontally.
- **Look for restrictions:** Note any holes, jumps, or asymptotes that limit the domain or range.
- **Eliminate incorrect options:** Use the process of elimination based on the visual clues.
- **Double-check:** Confirm that the selected options align with the graph's features.

Examples of Domain and Range from Graph Multiple Choice Questions

Example 1: Linear Function

Graph features: The line extends infinitely in both directions.

Question: What are the domain and range?

Options:

a) Domain: ?, Range: ?

b) Domain: [0, 10], Range: [2, 8]

c) Domain: (-?, 5], Range: [3, ?)

d) Domain: [1, 4], Range: [1, 4]

Answer: a) Domain: ?, Range: ?

Explanation: Since the line extends infinitely in both directions, the domain and range are all real numbers.

Example 2: Quadratic Function

Graph features: Parabola opening upwards, vertex at (2, 1), extending infinitely to the left and right, with y-values from 1 upwards.

Question: Determine the domain and range.

Options:

a) Domain: ?, Range: [1, ?)

b) Domain: [0, 4], Range: [1, 5]

c) Domain: (-?, 2], Range: (-?, 1]

d) Domain: [2, 6], Range: [1, 4]

Answer: a) Domain: ?, Range: [1, ?)

Explanation: The parabola opens upward with vertex at (2, 1), extending infinitely horizontally, and y-values starting at 1 and increasing without bound.

Common Mistakes and How to Avoid Them

- **Misinterpreting the graph:** Always verify the points and features rather than relying on assumptions.
- **Ignoring asymptotes:** Vertical asymptotes can restrict the domain; horizontal asymptotes impact the range.
- **Confusing bounded and unbounded graphs:** Recognize whether the graph extends infinitely

or is limited.
- **Overlooking gaps or holes:** These can exclude certain x or y-values from the domain or range.

Conclusion

Understanding how to identify the domain and range from graphs is a vital skill in mathematics, especially when tackling multiple-choice questions. By visually analyzing the graph's features and applying systematic strategies, learners can accurately determine the sets of possible inputs and outputs for various functions. Practice with diverse graphs enhances this skill, leading to better performance in exams and a deeper comprehension of mathematical functions. Remember, always verify the graph's features carefully, pay attention to restrictions like asymptotes or holes, and eliminate incorrect options logically to arrive at the correct answer confidently.

Understanding Domain and Range from Graphs: A Comprehensive Guide to Multiple Choice Questions

When studying functions in mathematics, one of the fundamental concepts to master is domain and range. These terms describe the set of possible input values (domain) and output values (range) of a function. Often, students encounter questions asking them to determine the domain and range from a graph, especially in multiple-choice formats. Such questions test not only your understanding of the concepts but also your ability to analyze visual data accurately. This guide aims to provide a detailed breakdown of how to interpret a graph to find the domain and range, with strategies tailored for multiple-choice questions, ensuring you become confident in tackling these problems.

What Are Domain and Range?

Before diving into graphical analysis, it?s essential to clarify what domain and range mean in the context of functions.

The Domain

The domain of a function is the set of all possible input values (usually represented as x-values) for which the function is defined. In a graph, the domain corresponds to the horizontal extent of the graph?that is, all x-values where the graph exists.

The Range

The range is the set of all possible output values (usually represented as y-values) that the function can produce. On a graph, this corresponds to the vertical extent?covering all y-values the graph reaches or passes through.

Analyzing Graphs for Domain and Range

When faced with a graph and multiple-choice options, the key is systematic analysis. Here?s a step-by-step approach:

Step 1: Identify the Graph's Extent Horizontally (Domain)

- Look at the leftmost point of the graph to find the minimum x-value where the graph exists.
- Look at the rightmost point to find the maximum x-value.
- Check whether the graph extends infinitely in either direction (e.g., arrows at the ends), which indicates the domain is all real numbers or unbounded in that direction.
- Be aware of any gaps, holes, or interruptions that limit the domain.

Step 2: Identify the Graph's Extent Vertically (Range)

- Find the lowest y-value the graph reaches.
- Find the highest y-value the graph reaches.
- Determine if the graph continues infinitely upward or downward (e.g., asymptotes or arrows). If so, the range might be unbounded.
- Note any flat segments or points where the graph stops, which can restrict the range.

Step 3: Consider Special Features

- Closed vs. open circles: Closed circles mean that point is included in the domain or range; open circles mean the point is not included.
- Vertical or horizontal asymptotes: These can affect the domain or range, often implying that certain values are excluded.
- Intervals: Multiple disconnected parts of the graph may indicate a union of intervals for the domain or range.

Step 4: Match Your Findings to Multiple Choice Options

- Once you determine the possible set(s) for the domain and range, compare with the options.
- Remember that options may be expressed as intervals, unions, or inequalities.
- Be cautious about whether the endpoints are inclusive (closed circle) or exclusive (open circle).

Common Graph Features and How They Influence Domain and Range

Understanding typical graph features and their impact on domain and range can simplify analysis.

- Linear Graphs

- Extends infinitely in both directions unless restricted.
- Domain: All real numbers.
- Range: All real numbers.

- Quadratic (Parabolic) Graphs

- Opens upwards or downwards.
- Domain: All real numbers (since quadratic functions are defined everywhere).
- Range: Depending on the vertex, the range will be either y ? minimum or y ? maximum.

- Absolute Value Graphs

- V-shaped graph.
- Domain: All real numbers.
- Range: y ? value at the vertex (if vertex is minimum).

- Piecewise or Restricted Graphs

- May have limited x-intervals.
- Domain: Limited to the x-intervals where the graph exists.
- Range: Corresponds to the y-values over those x-intervals.

- Graphs with Asymptotes

- Vertical asymptotes suggest certain x-values are excluded (domain excludes these points).
- Horizontal asymptotes can influence the limits of the range.

Practical Tips for Multiple Choice Questions

- Eliminate obviously wrong options first. For example, if the graph clearly extends from x = -2 to x = 3, options suggesting otherwise can be discarded.
- Pay attention to inclusivity. Closed circles imply the endpoint is included in the domain or range, while open circles do not.
- Look for asymptotes or gaps. These features can restrict the domain or range.
- Check the behavior at the ends of the graph. Does it go to infinity, approach a finite value, or stop abruptly?
- Compare the y-values visually. Is the graph bounded above or below? Does it extend infinitely?

Examples

Example 1: Graph with a Closed Circle at x = -3 and an Arrow to the Right

- Observation: The graph starts at x = -3 with a closed circle and extends infinitely to the right.
- Domain: x ? -3
- Range: Depending on the graph's vertical extent, e.g., y from 1 to infinity.
- Multiple-choice match: Look for options like [-3, ?) for domain and [1, ?) for range.

Example 2: Parabola Opening Up with Vertex at (0, 2)

- Observation: The parabola opens upward, vertex at (0, 2).
- Domain: All real numbers.
- Range: y ? 2.
- Multiple-choice match: Domain: (??, ?); Range: [2, ?).

Example 3: Graph with a Vertical Asymptote at x = 2

- Observation: The graph approaches but does not touch x = 2.
- Domain: All real x except x = 2.
- Range: depends on the behavior of the graph, perhaps all real y-values.
- Multiple-choice match: Domain: (??, 2) ? (2, ?).

Practice Strategies

- Use the graph's key features to quickly identify the extent of the domain and range.
- Translate visual cues into interval notation or inequalities.
- Be mindful of whether endpoints are included or excluded.
- Confirm your interpretation by checking the behavior at critical points.

Conclusion

Mastering domain and range from graph multiple choice questions requires a blend of conceptual understanding and careful visual analysis. By systematically examining the horizontal and vertical extents of a graph, noting features like asymptotes, holes, and the nature of the graph (bounded or unbounded), you can confidently select the correct options. Practice with various types of graphs enhances your ability to quickly interpret and analyze these visual representations, turning what might seem complex into straightforward problem-solving. Remember, the key lies in detailed observation and logical deduction?skills that are essential not just for exams but for a deep understanding of functions in mathematics.

QuestionAnswer What does the domain of a graph represent? The set of all possible x-values (input values) for which the graph is defined. How can you determine the range of a function from its graph? By identifying all the y-values that the graph attains or approaches. Which of the following is the correct domain for a graph that exists from x = -3 to x = 5? A) [-3, 5] B) (-?, ?) C) (??, 5] D) [?3, ?) If a graph is a parabola opening upward with vertex at (0, -2), what is the range? B) [-2, ?) A graph shows a horizontal line at y = 4 for all x-values. What is the range? A) {4} Which of these options best describes the domain of a function that is only defined between x = 1 and x = 7? C) [1, 7] From the graph, which is the correct way to find the range? By looking at the lowest and highest y-values the graph reaches or approaches. A graph shows a circle centered at (2, -3) with radius 3. What is the domain? B) [?1, 5] Which of the following best describes how to find the domain and range from a graph? Identify all x-values and y-values that the graph covers, including any open or closed intervals.

Related keywords: domain, range, graph, multiple choice, coordinates, x-axis, y-axis, functions, interval, values

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