

Domain and Range Quiz Answer Key PDF

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What is the range of the function $f(x) = \sqrt{x}$?

- A. $(-\infty, \infty)$
- B. $[0, \infty)$ ✓**
- C. $(-\infty, 0]$
- D. $[0, 1]$

Which of the following functions has a range of all real numbers?

- A. $f(x) = x^2$
- B. $f(x) = x^3$ ✓**
- C. $f(x) = \sqrt{x}$
- D. $f(x) = 1/x$

Which functions have a range of $(0, \infty)$? (Select all that apply)

- A. $f(x) = e^x$ ✓**
- B. $f(x) = \ln(x)$
- C. $f(x) = x^2 + 1$ ✓**
- D. $f(x) = 1/x$

For the function $f(x) = \sin(x)$, what is the range?

- A. $(-\infty, \infty)$
- B. $[0, 1]$
- C. $[-1, 1]$ ✓**
- D. $(0, \infty)$

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

- A. $(-\infty, \infty)$
- B. $[0, \infty)$
- C. $(0, \infty)$ ✓**
- D. $[-1, 1]$

Which of the following describes the domain of $f(x) = \ln(x)$?

- A. $(-\infty, \infty)$
- B. $(0, \infty)$ ✓**
- C. $[0, \infty)$
- D. $(-\infty, 0]$

What is the domain of the function $f(x) = 1/(x-2)$?

- A. $(-\infty, \infty)$
- B. $(-\infty, 2) \cup (2, \infty)$ ✓**
- C. $[2, \infty)$
- D. $(2, \infty)$

Which of the following are true about the function $f(x) = \cos(x)$? (Select all that apply)

- A. Domain is all real numbers ✓**
- B. Range is $[-1, 1]$ ✓**
- C. It is a periodic function ✓**
- D. It has vertical asymptotes

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

- A. $f(x) = x^2 + 3x + 2$ ✓**
- B. $f(x) = 1/(x-1)$
- C. $f(x) = \sin(x)$ ✓**
- D. $f(x) = \sqrt{x}$

Explain how to determine the domain of a rational function.

To determine the domain of a rational function, identify the values of x that make the denominator equal to zero and exclude those values from the domain.

Describe the process of finding the range of a quadratic function.

To find the range of a quadratic function, analyze the vertex to determine the minimum or maximum value, depending on whether the parabola opens upward or downward. This value helps define the range of the function.

What is the significance of the vertical line test in relation to domain and range?

The vertical line test is significant because it helps determine if a graph represents a function by ensuring that each input (x -value) corresponds to only one output (y -value). If a vertical line intersects the graph at more than one point, it is not a function.

How does the concept of asymptotes affect the domain and range of a function?

Asymptotes affect the domain and range of a function by indicating values that the function approaches but never reaches. This can exclude certain x -values from the domain and limit y -values in the range.

Provide an example of a piecewise function and explain how to determine its domain and range.

An example of a piecewise function is $f(x) = \{ x^2, x < 0; x + 1, x \geq 0 \}$. To determine its domain, consider the domains of each piece, which in this case is all real numbers. To find the range, evaluate the outputs of each piece: the first piece has a range of $[0, \infty)$ and the second piece has a range of $[1, \infty)$, so the overall range is $[0, \infty)$.

Discuss how the domain and range of a function are affected when it is composed with another function.

When composing functions, the domain of the composite function is restricted to the domain of the inner function, and the range of the inner function must fit within the domain of the outer function. The overall range is determined by evaluating the outputs of the composite function.

For the function $f(x) = 1/(x^2 - 1)$, which values are excluded from the domain? (Select all that apply)

A. $x = 0$

B. $x = 1$ ✓

C. $x = -1$ ✓

D. $x = 2$

Which of the following functions has a domain of all real numbers?

A. $f(x) = 1/x$

B. $f(x) = \ln(x)$

C. $f(x) = x^3$ ✓

D. $f(x) = \sqrt{x}$

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

A. $(-\infty, \infty)$ ✓

B. $[0, \infty)$

C. $(-\infty, 0]$

D. $[0, 1]$

Which of the following functions have restricted domains due to division by zero? (Select all that apply)

A. $f(x) = 1/x$ ✓

B. $f(x) = 1/(x-2)$ ✓

C. $f(x) = x^2$

D. $f(x) = (x+1)/(x^2-4)$ ✓

Which of the following functions have a range of $[0, \infty)$? (Select all that apply)

A. $f(x) = x^2$ ✓

B. $f(x) = \sqrt{x}$ ✓

C. $f(x) = e^x$

D. $f(x) = |x|$ ✓