Functions Quiz Questions and Answers PDF

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Which of the following functions is bijective?

- ◯ f(x) = x^2
- ◯ **f(x) = 2x + 3 ✓**
- ◯ f(x) = sin(x)
- ◯ f(x) = e^x

> A function is bijective if it is both injectively (one-to-one) and surjectively (onto) mapping between its domain and codomain. To determine if a function is bijective, one must check if every element in the codomain is mapped by exactly one element from the domain.

What type of function is f(x) = ax^2 + bx + c?

- ◯ Linear
- ◯ **Quadratic ✓**
- ◯ Exponential
- ◯ Logarithmic

> The function f(x) = ax^2 + bx + c is a quadratic function, characterized by its highest degree of 2. It represents a parabolic graph that can open upwards or downwards depending on the sign of the coefficient 'a'.

Which of the following functions are injectively? (Select all that apply)

- ☐ **f(x) = x^3 ✓**
- ☐ f(x) = x^2
- ☐ **f(x) = 2x + 1 ✓**
- ☐ f(x) = sin(x)

> Injectively functions are those where each element of the codomain is mapped by at most one element of the domain. To determine which functions are injectively, we need to check if any two different inputs produce the same output.

What is the primary characteristic of a function in mathematics?

- ◯ It relates multiple outputs to a single input.
- ◯ **It relates each input to exactly one output. ✓**
- ◯ It can have multiple inputs for a single output.
- ◯ It does not have a defined domain.

> The primary characteristic of a function in mathematics is that each input is associated with exactly one output. This means that for every value in the domain, there is a unique value in the range.

Which of the following is a linear function?

- ◯ f(x) = x^2 + 3x + 2
- ◯ **f(x) = 3x + 5 ✓**
- ◯ f(x) = 2^x
- ◯ f(x) = log(x)

> A linear function is defined as a function that can be graphically represented as a straight line, typically in the form of y = mx + b, where m is the slope and b is the y-intercept.

Which test can be used to determine if a graph represents a function?

- ◯ Horizontal Line Test
- ◯ Diagonal Line Test
- ◯ **Vertical Line Test ✓**
- ◯ Parallel Line Test

> The vertical line test can be used to determine if a graph represents a function. If any vertical line intersects the graph at more than one point, the graph does not represent a function.

Which of the following is not a trigonometric function?

- ◯ Sine
- ◯ Cosine
- ◯ Tanget
- ◯ **Logarithm ✓**

> Trigonometric functions include sine, cosine, and tangent, while functions like logarithm or exponential are not part of this category. Therefore, any option that is not one of these three would be the correct answer.

Which of the following are properties of a function? (Select all that apply)

- [ ] **Domain ✓**
- [ ] **Range ✓**
- [ ] **Codomain ✓**
- [ ] Multiplicity

> A function must have a unique output for each input, meaning it cannot assign the same input to multiple outputs. Additionally, a function can be represented in various forms, such as equations, graphs, or tables, but it must always adhere to the definition of mapping inputs to unique outputs.

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

- ◯ All real numbers
- ◯ **All positive real numbers ✓**
- ◯ All non-negative real numbers
- ◯ All integers

> The range of the function f(x) = e^x is all positive real numbers, which can be expressed as (0, ∞). This means that as x approaches negative infinity, f(x) approaches 0, but never actually reaches it.

What are the applications of functions in real-world scenarios? (Select all that apply)

- [ ] **Modelinging population growth ✓**
- [ ] **Designining algorithms ✓**
- [ ] Solving linear equations
- [ ] **Analyzing financial trends ✓**

> Functions are widely used in various real-world applications such as finance for calculating interest, in engineering for modeling physical systems, and in computer science for algorithm design and data processing.

Which functions are considered polynomial functions? (Select all that apply)

- [ ] **f(x) = 3x^2 + 2x + 1 ✓**
- [ ] **f(x) = 5x^3 - 4x + 7 ✓**
- [ ] f(x) = log(x)
- [ ] f(x) = 2^x

> Polynomial functions are defined as functions that can be expressed in the form of a polynomial equation, which includes terms with non-negative integer exponents. Examples of polynomial functions

include linear functions, quadratic functions, and cubic functions, among others.

What is the domain of the function f(x) = sqrt(x)?

- ◯ All real numbers
- ◯ All positive real numbers
- ◯ **All non-negative real numbers ✓**
- ◯ All integers

The domain of the function f(x) = sqrt(x) includes all non-negative real numbers, as the square root is only defined for values greater than or equal to zero.

Which of the following are examples of exponential functions? (Select all that apply)

- ☐ **f(x) = 3^x ✓**
- ☐ f(x) = x^3
- ☐ **f(x) = e^x ✓**
- ☐ f(x) = log(x)

Exponential functions are characterized by a constant base raised to a variable exponent. Common examples include functions like f(x) = 2^x and f(x) = e^x, where the base is a constant and the exponent is a variable.

What are the characteristics of a quadratic function? (Select all that apply)

- ☐ **It has a degree of 2. ✓**
- ☐ **Its graph is a parabola. ✓**
- ☐ It is always increasing.
- ☐ **It can have two, one, or no real roots. ✓**

Quadratic functions are characterized by their parabolic shape, a degree of 2, and can be expressed in the standard form y = ax^2 + bx + c, where a, b, and c are constants. They also have a vertex, axis of symmetry, and can open upwards or downwards depending on the sign of 'a'.