



O Level Maths

Topic: Inverse Functions

Instructions

Answer all questions. Show all necessary steps. Use the concept of inverse functions and their properties to solve the problems.

Practice Problems

Finding Inverse Functions:

1. Find the inverse of the function $f(x) = 2x + 3$.
2. Find the inverse of the function $f(x) = \frac{3x-5}{2}$.
3. Given the function $f(x) = x^2 + 4x + 5$, find the inverse of $f(x)$ (if possible).
4. Find the inverse of the function $g(x) = \frac{1}{x-2}$.

Verify Inverse Functions:

5. Verify that $f(x) = 2x + 1$ and $g(x) = \frac{x-1}{2}$ are inverse functions.
6. Verify that the functions $f(x) = 3x + 4$ and $g(x) = \frac{x-4}{3}$ are inverses of each other by showing that $f(g(x)) = x$ and $g(f(x)) = x$.
7. Verify that $f(x) = x^2 + 1$ and $g(x) = \sqrt{x-1}$ are inverse functions (where the domain of f is restricted to $x \geq 0$).

Multiple-Choice Questions

1. Which of the following functions is the inverse of $f(x) = 2x + 5$?
 - A. $f^{-1}(x) = \frac{x-5}{2}$
 - B. $f^{-1}(x) = 2x - 5$
 - C. $f^{-1}(x) = \frac{2x-5}{1}$
 - D. $f^{-1}(x) = \frac{x+5}{2}$
2. The inverse of the function $f(x) = \frac{1}{x+1}$ is:
 - A. $f^{-1}(x) = \frac{1}{x-1}$
 - B. $f^{-1}(x) = \frac{1}{x+1}$
 - C. $f^{-1}(x) = \frac{1}{x} - 1$
 - D. $f^{-1}(x) = -\frac{1}{x}$
3. Which of the following is true for a function to have an inverse?
 - A. The function must be one-to-one (injective).
 - B. The function must be onto (surjective).
 - C. The function must be both one-to-one and onto.
 - D. The function can be neither one-to-one nor onto.
4. What is the domain of the inverse of the function $f(x) = x^2 + 1$, where $x \geq 0$?
 - A. $x \geq 1$
 - B. $x \geq 0$
 - C. $x \geq -1$
 - D. $x \geq 2$
5. Which of the following is the inverse of $f(x) = 3x + 4$?
 - A. $f^{-1}(x) = \frac{x+4}{3}$
 - B. $f^{-1}(x) = \frac{x-4}{3}$
 - C. $f^{-1}(x) = 3x - 4$
 - D. $f^{-1}(x) = 3x + 4$

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