

Proving strict monotonicity of a function in the given set

Read the definition on strict monotonicity of a function.

Definition

A number function f is **strictly monotonic** in a set S if it is either strictly **monotonically increasing** or **strictly monotonically decreasing** throughout S .

- f is **strictly monotonically increasing** in S if for all $x_1, x_2 \in S$ with $x_1 < x_2$, holds that $f(x_1) < f(x_2)$
- f is strictly **monotonically decreasing** in S if for all $x_1, x_2 \in S$ with $x_1 < x_2$, holds that $f(x_1) > f(x_2)$

Task 1. Prove that the function given with the formula $f(x) = \frac{3x-16}{x-5}$ is strictly monotonic in the interval $(5, \infty)$. What kind of monotonicity is it, increasing or decreasing?

Task 2. Prove that the function given with the formula $f(x) = \frac{x+10}{x+7}$ is strictly monotonic in the interval $(-\infty, -7)$. What kind of monotonicity is it, increasing or decreasing?