

Objective: Determine whether a function has an inverse function.

Show that the function $f(x) = \cot x$ is strictly monotonic on the interval $(0, \pi)$ and, as a result, has an inverse function.

ANSWER:

$$f(x) = \cot x; (0, \pi)$$

$$f'(x) = -\csc^2 x < 0 \text{ from } (0, \pi)$$

$f(x)$ is decreasing on the interval $(0, \pi)$. Therefore, we can say that $f(x)$ is strictly monotonic and has an inverse.