

Problem 50

What is the range of:

$$f(x) = \frac{\sqrt{x^2-1}+x}{\sqrt{1-x^2}+x-1}$$

Answer

$$\boxed{\left\{\frac{1}{2}\right\}}$$

Explanation

$$x^2 - 1 \geq 0 \text{ and } 1 - x^2 \geq 0 \Rightarrow x = \pm 1$$

Since $x = 1$ would result in dividing by zero, the domain is the singleton $\{-1\}$. Thus, the range is $\{f(-1)\} = \left\{\frac{1}{2}\right\}$