
Algebra1 Test N°02

Exercise :

(I) Let $f : \mathbb{R} \rightarrow \mathbb{R}$ with $f(x) = \frac{x}{x^2+1}$

1. Show that $\forall a \in \mathbb{R}^*, f(a) = f(\frac{1}{a})$, is f one to one?
2. Solve in \mathbb{R} , the equation $f(x) = 2$, is f onto?
3. Determine $f(\mathbb{R})$.

(II) Let the function f defined on $I = [0, 1[$ by

$$f(x) = \frac{1}{\sqrt{1-x^2}}, \quad \forall x \in I.$$

Determine $f(I)$, prove that f realize a bijection from I to $f(I)$, and determine its reciprocal application.