
Algebra1 Test N°01

Exercise :

(I) Write the negation of the following assertions, and justify if these assertions are true or false

1. $(\forall x \in \mathbb{R},\ x-1 \neq 0)$ or $\big(\forall x \in \mathbb{R},\ x^2+1 \neq 0\big)$.
2. $\forall x \in \mathbb{R}_+,\ \exists \alpha \in \mathbb{R}_+,\ x+1 \geq \alpha$.

(II) Using the quantifiers $\forall$ and $\exists$, write the following

1. For any real number x, its square is positif.
2. For any natural number n, there exists a real number x, such that the exponential of x is equal to n.

(III) Prove by induction that

$$\sum_{k=1}^{n} \frac{1}{k(k+1)} = \frac{n}{n+1},\ \forall n \in \mathbb{N}^*.$$