Real Analysis - Quiz 1

- Course: M24MA4.101 (Real Analysis)
- Type: Quiz
- Number: 1
- Date: 2024-08-27

Question 1

> 3 marks

Verify that the sum of squares of the first $2n$ terms is given by:

$$1^2 + 2^2 + 3^2 + \cdot + (2n)^2 = \frac{n(2n+1)(4n+1)}{3}$$

Note that $n \in \mathbb{N}$ and that $n \geq 1$.

Question 2

> 3 marks

Prove that:

i. $(A \cup B)' = A' \cap B'$

ii. $(A \cap B)' = A' \cup B'$

Question 3

> 4 marks

Prove using induction that if $1 + x > 0$, then the following is true for all $n \in \mathbb{N}$.

$$(1 + x)^n \geq 1 + nx$$