

1. Compute

$$\lim_{n \rightarrow \infty} \sum_{k=0}^n \operatorname{arccot}(k^2 + k + 1).$$

SOLUSI:

2. Prove that

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right) \left(1 + \frac{2}{n}\right)^{1/2} \cdots \left(1 + \frac{n}{n}\right)^{1/n} = e^{\pi^2/12}.$$

3. Let $(a_n)_{n \geq 1}$ be an arithmetic progression of positive numbers. Compute

$$\lim_{n \rightarrow \infty} \frac{n(a_1 \cdots a_n)^{1/n}}{a_1 + \cdots + a_n}.$$