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

SOLUSI:

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

3. Let $(a_n)_{n\geq 1}$ be an arithmetic progression of positive numbers. Compute
$$\lim_{n\to\infty} \frac{n\,(a_1 \cdots a_n)^{1/n}}{a_1+\cdots+a_n}.$$