基礎数学 I

1

以下の問いに答えよ.

(i) 不等式

$$2 \leqq \left(1+\frac{1}{n}\right)^n, \qquad n=1,2,\ldots$$

を示せ.

(ii) 極限

$$\lim_{n\to\infty} \sqrt[n]{2}$$

を求めよ.

(iii) $a, b > 0$ のとき

$$\lim_{n\to\infty} \sqrt[n]{a^n+b^n} = \max(a,b)$$

を示せ.

(iv) $a_1, a_2, \ldots, a_k > 0 \quad (k \geqq 3)$ のとき

$$\lim_{n\to\infty} \sqrt[n]{a_1^n+a_2^n+\cdots+a_k^n} = \max(a_1, a_2, \ldots, a_k)$$

を示せ.

An English Translation:

Basic Mathematics I

1

Answer the following questions.

(i) Show the inequality

$$2 \leqq \left(1+\frac{1}{n}\right)^n, \qquad n = 1, 2, \ldots.$$

(ii) Compute the limit

$$\lim_{n\to\infty} \sqrt[n]{2}.$$

(iii) Show that

$$\lim_{n\to\infty} \sqrt[n]{a^n + b^n} = \max(a, b)$$

for $a, b > 0$.

(iv) Show that

$$\lim_{n\to\infty} \sqrt[n]{a_1^n + a_2^n + \cdots + a_k^n} = \max(a_1, a_2, \ldots, a_k)$$

for $a_1, a_2, \ldots, a_k > 0$ $(k \geqq 3)$.