

Kolokwium 2

Wersja testu **A** 22 listopada 2022 r.

1. Podaj część całkowitą liczby.

a) $\left[\frac{1}{4 - \sqrt{15}} \right] = \dots\dots\dots$

b) $\left[\frac{1}{\sqrt{17} - 4} \right] = \dots\dots\dots$

c) $\left[\frac{1}{9 - \sqrt{79}} \right] = \dots\dots\dots$

d) $\left[\frac{1}{\sqrt{83} - 9} \right] = \dots\dots\dots$

2. Podaj wartość granicy.

a) $\lim_{n \rightarrow \infty} (\sqrt[5]{n^5 + 4n^4} - n) = \dots\dots\dots$

b) $\lim_{n \rightarrow \infty} (\sqrt[4]{n^4 + 3n^3} - n) = \dots\dots\dots$

c) $\lim_{n \rightarrow \infty} (\sqrt[3]{n^3 + 2n^2} - n) = \dots\dots\dots$

d) $\lim_{n \rightarrow \infty} (\sqrt{n^2 + n} - n) = \dots\dots\dots$

3. Podaj kres dolny zbioru.

a) $\inf\{x^3 : x \in [-2, 1]\} = \dots\dots\dots$

b) $\inf\{x^2 : x \in [-2, 1]\} = \dots\dots\dots$

c) $\inf\{x^5 : x \in [-2, 1]\} = \dots\dots\dots$

d) $\inf\{x^4 : x \in [-2, 1]\} = \dots\dots\dots$

4. Podaj kres górny zbioru.

a) $\sup\{x^5 : x \in [-2, 1]\} = \dots\dots\dots$

b) $\sup\{x^2 : x \in [-2, 1]\} = \dots\dots\dots$

c) $\sup\{x^3 : x \in [-2, 1]\} = \dots\dots\dots$

d) $\sup\{x^4 : x \in [-2, 1]\} = \dots\dots\dots$

5. Podaj kres górny zbioru.

a) $\sup\left\{\frac{1}{2^n - 50} : n \in \mathbb{N}\right\} = \dots\dots\dots$ b) $\sup\left\{\frac{1}{2^n - 70} : n \in \mathbb{N}\right\} = \dots\dots\dots$

c) $\sup\left\{\frac{1}{2^n - 60} : n \in \mathbb{N}\right\} = \dots\dots\dots$ d) $\sup\left\{\frac{1}{2^n - 80} : n \in \mathbb{N}\right\} = \dots\dots\dots$

6. Podaj kres górny zbioru.

a) $\sup\left\{\frac{1}{n^2 - 10n + 49} : n \in \mathbb{N}\right\} = \dots\dots\dots$

b) $\sup\left\{\frac{1}{n^2 - 10n + 36} : n \in \mathbb{N}\right\} = \dots\dots\dots$

c) $\sup\left\{\frac{1}{n^2 - 10n + 27} : n \in \mathbb{N}\right\} = \dots\dots\dots$

d) $\sup\left\{\frac{1}{n^2 - 10n + 32} : n \in \mathbb{N}\right\} = \dots\dots\dots$

7. Podaj wartość granicy.

a) $\lim_{n \rightarrow \infty} \sum_{k=n}^{2n} \frac{k}{\sqrt{n^4 + k}} = \dots\dots\dots$ b) $\lim_{n \rightarrow \infty} \sum_{k=n}^{3n} \frac{k}{\sqrt{n^4 + k}} = \dots\dots\dots$

c) $\lim_{n \rightarrow \infty} \sum_{k=3n}^{7n} \frac{k}{\sqrt{n^4 + k}} = \dots\dots\dots$ d) $\lim_{n \rightarrow \infty} \sum_{k=2n}^{5n} \frac{k}{\sqrt{n^4 + k}} = \dots\dots\dots$

8. Podaj wartość granicy.

a) $\lim_{n \rightarrow \infty} \frac{\binom{n}{3}^4}{\binom{n}{4}^3} = \dots\dots\dots$

b) $\lim_{n \rightarrow \infty} \frac{\binom{n}{2}^5}{\binom{n}{5}^2} = \dots\dots\dots$

c) $\lim_{n \rightarrow \infty} \frac{\binom{n}{2}^3}{\binom{n}{3}^2} = \dots\dots\dots$

d) $\lim_{n \rightarrow \infty} \frac{\binom{n}{2}^2}{\binom{n}{4}} = \dots\dots\dots$

9. Podaj kres górny zbioru.

a) $\sup \left\{ \frac{mn}{49m^2 + 25n^2} : m, n \in \mathbb{N} \right\} = \dots\dots\dots$

b) $\sup \left\{ \frac{mn}{4m^2 + 25n^2} : m, n \in \mathbb{N} \right\} = \dots\dots\dots$

c) $\sup \left\{ \frac{mn}{m^2 + 25n^2} : m, n \in \mathbb{N} \right\} = \dots\dots\dots$

d) $\sup \left\{ \frac{mn}{9m^2 + 25n^2} : m, n \in \mathbb{N} \right\} = \dots\dots\dots$

10. Podaj taką liczbę wymierną w , aby dana liczba była wymierna.

a) $\log_{12}(6 \cdot 48^w) \in \mathbb{Q}$ dla $w = \dots\dots\dots$

b) $\log_{12}(6 \cdot 32^w) \in \mathbb{Q}$ dla $w = \dots\dots\dots$

c) $\log_{12}(6 \cdot 18^w) \in \mathbb{Q}$ dla $w = \dots\dots\dots$

d) $\log_{12}(6 \cdot 27^w) \in \mathbb{Q}$ dla $w = \dots\dots\dots$