

Granice ciągów

Zadanie 1.

Oblicz granice:

$$1. \lim_{n \rightarrow \infty} \frac{1}{n} =$$

$$2. \lim_{n \rightarrow \infty} \frac{5+\sqrt{2}}{n^2} =$$

$$3. \lim_{n \rightarrow \infty} \frac{200 \cdot (-1)^n}{n} =$$

$$4. \lim_{n \rightarrow \infty} \frac{7n^5 - 3n^4 + 2n^2 - 1}{4n^5 + \pi} =$$

$$5. \lim_{n \rightarrow \infty} \frac{7n^5 - 2n}{4n^4 + 1} =$$

$$6. \lim_{n \rightarrow \infty} \frac{7n^5 - 2n}{4n^6 + 1} =$$

$$7. \lim_{n \rightarrow \infty} \left(\frac{1}{2}\right)^n =$$

$$8. \lim_{n \rightarrow \infty} (0,9)^n =$$

$$9. \lim_{n \rightarrow \infty} \frac{(-2)^n}{4} =$$

$$10. \lim_{n \rightarrow \infty} \frac{5^n - 4}{3^n + 4 \cdot 5^n} =$$

$$11. \lim_{n \rightarrow \infty} \left(\frac{6n^3 + 3n^2 - 1}{2n^3} + (2 - \sqrt{2})^n - \frac{1 - 3^n}{1 + 3^n} \right) =$$

$$12. \lim_{n \rightarrow \infty} \sqrt[n]{64} =$$

$$13. \lim_{n \rightarrow \infty} \sqrt[n]{5 \cdot 2^n} =$$

$$14. \lim_{n \rightarrow \infty} \sqrt[n]{8^n + 5^n} =$$

$$15. \lim_{n \rightarrow \infty} \sqrt[n]{6 \cdot 2^n + 7 \cdot 3^n + 8 \cdot 4^n} =$$

$$16. \lim_{n \rightarrow \infty} \frac{1+2+3+\dots+2n}{3n^2-n} =$$

$$17. \lim_{n \rightarrow \infty} (3n^2 - 5) =$$

$$18. \lim_{n \rightarrow \infty} (n^4 - 5n^3) =$$

$$19. \lim_{n \rightarrow \infty} (n^2 - n^3) =$$

$$20. \lim_{n \rightarrow \infty} (\sqrt{n+2} - \sqrt{n+1}) =$$

$$21. \lim_{n \rightarrow \infty} (\sqrt{9n^2 + n} - 3n) =$$

$$22. \lim_{n \rightarrow \infty} (-2^n + 5^n - 4^n) =$$

Zadanie 2.

Jeżeli wiadomo, że $\lim_{n \rightarrow \infty} a_n = +\infty$ oraz $\lim_{n \rightarrow \infty} b_n = +\infty$, to:

a) $\lim_{n \rightarrow \infty} (a_n + b_n) =$

b) $\lim_{n \rightarrow \infty} (a_n - b_n) =$

c) $\lim_{n \rightarrow \infty} (a_n \cdot b_n) =$

d) $\lim_{n \rightarrow \infty} \left(\frac{a_n}{b_n} \right) =$

Zadanie 3.

Dla jakiego parametru p granicą ciągu

$$a_n = \frac{p + 2p + 3p + \dots + np}{5n^2 - 1}$$

jest liczba 3?