Zadanie 1. Wyznaczyć k-ty wyraz ciągu a_n.

(1) $a_n = 2n+1$, $k = 1, 2, 7, n+1, n+7$

(2) $a_n = 2^{n+1}$, $k = 1, 3, 6, n-2, n+3$

(3) $a_n = \dfrac{n}{n+1}$, $k = 2, 4, 7, n-1, 2n+3$

(4) $a_n = \dfrac{(-1)^n}{n^2}$, $k = 1, 2, 3, 4, 8, 9, 2n, 2n+1$

(5) $a_n = \dfrac{4n^2+5n-2}{3n^2-n+6}$, $k = 1, 2, n-1$

Zadanie 2. Obliczyć granice ciągów.

(1) $a_n = \dfrac{n}{n+1}$

(2) $a_n = \dfrac{4n-3}{6-5n}$

(3) $a_n = \dfrac{4n^2+5n-2}{3n^2-n+6}$

(4) $a_n = \dfrac{2n^3-4n-1}{6n+3n^2-n^3}$

(5) $a_n = \left(\dfrac{2n^2+3n-1}{n^2+5n+2}\right)^2$

(6) $a_n = \dfrac{(n-1)(n+3)}{3n^2+5}$

(7) $a_n = \dfrac{(2n-1)^2}{(4n-1)(3n+2)}$

(8) $a_n = \dfrac{(2n-1)^3}{(4n-1)^2(1-5n)}$

(9) $a_n = \dfrac{3}{n} - \dfrac{10}{\sqrt{n}}$

(10) $a_n = \left(\dfrac{5n-2}{3n-1}\right)^3$

(11) $a_n = \dfrac{(\sqrt{n}+3)^2}{n+1}$

(12) $a_n = \dfrac{\sqrt{n}-2}{3n+5}$

(13) $a_n = \dfrac{\sqrt{1+2n^2}-\sqrt{1+4n^2}}{n}$

(14) $a_n = \sqrt{\dfrac{3n-2}{n+10}}$

(15) $a_n = \sqrt[3]{\dfrac{n-1}{8n+10}}$

(16) $a_n = \dfrac{\sqrt{n^2+4}}{3n-2}$

(17) $a_n = \dfrac{\sqrt{n^2-1}}{\sqrt[3]{n^3+1}}$

(18) $a_n = \dfrac{n}{\sqrt[3]{8n^3-n}-n}$

(19) $a_n = \dfrac{\sqrt{4n^2+2}}{3n+1}$

(20) $a_n = \dfrac{\sqrt{n}}{\sqrt{n+\sqrt{n+\sqrt{n}}}}$

Zadanie 3. Obliczyć granice ciągów.

(1) $a_n = \dfrac{4n^3-5n+1}{3n^5+2n^2-4}$

(2) $a_n = \dfrac{n^2-1}{3-n^3}$

(3) $a_n = \dfrac{1}{\sqrt{4n^2+7n}-2n}$

Zadanie 4. Obliczyć granice ciągów.

(1) $a_n = \dfrac{2n^2-5n+8}{15n-3}$

(2) $a_n = \dfrac{2-5n-10n^2}{3n+15}$

(3) $a_n = \dfrac{2-5n-10n^2}{3n+15}$

Zadanie 5. Obliczyć granice ciągów.

(1) $a_n = \sqrt{n+2} - \sqrt{n}$

(2) $a_n = \sqrt{n^2+n} - n$

(3) $a_n = n - \sqrt{n^2+5n}$

(4) $a_n = \sqrt{3n^2+2n-5} - n\sqrt{3}$

(5) $a_n = 3n - \sqrt{9n^2+6n-15}$

(6) $a_n = \sqrt[3]{n^3+4n^2} - n$

(7) $a_n = n\sqrt[3]{2} - \sqrt[3]{2n^3+5n^2-7}$

(8) $a_n = \sqrt{4n^2+5n-7} - 2n$

(9) $a_n = \sqrt[3]{n^3+2n^2+4} - \sqrt[3]{n^3+1}$

(10) $a_n = \sqrt{n^2+3} + n$

(11) $a_n = \dfrac{3}{\sqrt{9n^2+3n}-3n}$

(12) $a_n = \sqrt{n+\sqrt{n}} - \sqrt{n-\sqrt{n}}$

(13) $a_n = \sqrt{n(n-\sqrt{n^2-1})}$

(14) $a_n = n(\sqrt{2n^2+1} - \sqrt{2n^2-1})$

Zadanie 6. Obliczyć granice ciągów.

(1) $a_n = \dfrac{(0,99)^n}{n+1}$

(2) $a_n = \dfrac{3\cdot 9^n - 7}{9^n+4}$

(3) $a_n = \dfrac{2^n+3^n}{3\cdot 2^n + 3\cdot 4^n}$

(4) $a_n = \dfrac{4^{n-1}-5}{2^{2n}-7}$

(5) $a_n = \dfrac{5\cdot 3^{2n}-1}{4\cdot 9^n+7}$

(6) $a_n = \dfrac{3\cdot 2^{2n+2}-10}{5\cdot 4^{n-1}+3}$

(7) $a_n = \dfrac{-8^{n-1}}{7^{n+1}}$

(8) $a_n = \dfrac{2^{n+1}-3^{n+2}}{3^{n+2}}$

(9) $a_n = \left(\dfrac{3}{2}\right)^n \cdot \dfrac{2^{n+1}-1}{3^{n+1}-1}$

Zadanie 7. Obliczyć granice ciągów.

(1) $a_n = \left(1+\dfrac{2}{n}\right)^n$

(2) $a_n = \left(\dfrac{n+5}{n}\right)^n$

(3) $a_n = \left(1+\dfrac{4}{n}\right)^n$

(4) $a_n = \left(\dfrac{n}{n+1}\right)^n$

(5) $a_n = \left(1+\dfrac{2}{n}\right)^n$

(6) $a_n = \left(\dfrac{n-4}{n}\right)^{3n+1}$

(7) $a_n = \left(1-\dfrac{3}{n}\right)^n$

(8) $a_n = \left(1-\dfrac{4}{n}\right)^{-n+3}$

(9) $a_n = \left(\dfrac{n^2+6}{n^2}\right)^{n^2}$

(10) $a_n = \left(\dfrac{n^2+2}{2n^2+1}\right)^{n^2}$

(11) $a_n = \left(1-\dfrac{1}{n^2}\right)^n$