Granice ciągów

Zad 1.

Oblicz granicę ciągów

1) $u_n = \frac{n}{n+1}$
2) $u_n = \frac{4n-3}{6-5n}$
3) $u_n = \frac{n^2-1}{3-n^3}$
4) $u_n = \frac{2n^3-4n-1}{6n+3n^2-n^3}$
5) $u_n = \frac{(n-1)(n+3)}{3n^2+5}$
6) $u_n = \frac{(2n-1)^2}{(4n-1)(3n+2)}$
7) $u_n = \frac{(2n-1)^3}{(4n-1)^2(1-5n)}$
8) $u_n = \frac{3}{n} - \frac{10}{\sqrt{n}}$
9) $u_n = \frac{(-1)^n}{2n-1}$
10) $u_n = (\frac{2n-3}{3n+1})^2$
11) $u_n = (\frac{5n-2}{3n-1})^3$
12) $u_n = \frac{(\sqrt{n}+3)^2}{n+1}$
13) $u_n = \frac{\sqrt{n}-2}{3n+5}$
14) $u_n = \frac{n-10}{3}$
15) $u_n = \frac{(-0{,}8)^n}{2n-5}$
16) $u_n = \frac{2-5n-10n^2}{3n+15}$
17) $u_n = \frac{2n+(-1)^n}{n}$
18) $u_n = \frac{\sqrt{1+2n^2}-\sqrt{1+4n^2}}{n}$
19) $u_n = \sqrt{\frac{3n-2}{n+10}}$
20) $u_n = \sqrt[3]{\frac{n-1}{8n+10}}$
21) $u_n = \frac{\sqrt{n^2+4}}{3n-2}$
22) $u_n = \frac{n}{\sqrt[3]{n^3+1}}$
23) $u_n = \frac{n}{\sqrt[3]{8n^3-n}-n}$
24) $u_n = \frac{1}{\sqrt{4n^2+7n}-2n}$
25) $u_n = \sqrt{n+2} - \sqrt{n}$
26) $u_n = \sqrt{n^2+n} - n$
27) $u_n = n - \sqrt{n^2+5n}$
28) $u_n = \sqrt{3n^2+2n-5} - n\sqrt{3}$
29) $u_n = 3n - \sqrt{9n^2+6n-15}$
30) $u_n = \sqrt[3]{n^3+4n^2} - n$

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

32) $u_n = \frac{4^n - 1}{2^{2n} - 7}$

33) $u_n = \frac{5 \cdot 3^{2n} - 1}{4 \cdot 9^n + 7}$

34) $u_n = \frac{3 \cdot 2^{2n+2} - 10}{5 \cdot 4^{n-1} + 3}$

35) $u_n = \frac{-8^n - 1}{7^{n+1}}$

36) $u_n = \frac{2^{n+1} - 3^{n+2}}{3^{n+2}}$

37) $u_n = (\frac{3}{2})^n \frac{2^{n+1} - 1}{3^{n+1} - 1}$

38) $u_n = \sqrt[n]{3^n + 2^n}$

39) $u_n = \sqrt[n]{10^n + 9^n + 8^n}$

40) $u_n = \sqrt[n]{10^{100} - \frac{1}{10^{100}}}$

41) $u_n = \sqrt[n]{(\frac{2}{3})^n + (\frac{3}{4})^n}$

42) $u_n = \frac{1 + 2 + ... + n}{n^2}$

43) $u_n = \frac{1^2 + 2^2 + ... + n^2}{n^3}$