Zadania z analizy matematycznej. Ciągi liczbowe.

1. Oblicz granice:
   (a) $\lim\limits_{n\to\infty} \frac{n^5-9n^3+2n^2-98n+8}{2n^5-8n^4+34n^3-2}$,
   (b) $\lim\limits_{n\to\infty} \frac{n^3-6n^2+7n^4-3}{n^3-3n^2+7}$,
   (c) $\lim\limits_{n\to\infty} \frac{(3n^2-2)^2}{(2n^3+1)(n-1)}$
   (d) $\lim\limits_{n\to\infty} \frac{\sqrt{n^2+4}}{3n-2}$,
   (e) $\lim\limits_{n\to\infty} \frac{\sqrt{1+2n^2}-\sqrt{1+4n^2}}{n}$.
2. Oblicz granice:
   (a) $\lim\limits_{n\to\infty} \left(\sqrt{n+2}-\sqrt{n}\right)$,
   (b) $\lim\limits_{n\to\infty} \left(n-\sqrt{n^2-5n}\right)$,
   (c) $\lim\limits_{n\to\infty} \left(3n-\sqrt{9n^2+6n-15}\right)$,
   (d) $\lim\limits_{n\to\infty} \left(\sqrt[3]{n^3+4n^2}-\sqrt{n}\right)$.
3. Oblicz granice:
   (a) $\lim\limits_{n\to\infty} \sqrt[n]{2\cdot 3^n+4\cdot 7^n}$,
   (b) $\lim\limits_{n\to\infty} \sqrt[n]{10^n+7^n+\left(\frac{1}{2}\right)^n}$,
   (c) $\lim\limits_{n\to\infty} \sqrt[n]{\left(\frac{1}{3}\right)^n+\left(\frac{4}{5}\right)^n+\left(\frac{3}{4}\right)^n}$,
   (d) $\lim\limits_{n\to\infty} \frac{n}{n^2-1}\sin(3n+1)$,
   (e) $\lim\limits_{n\to\infty} \frac{\cos(n^2)}{n^2}$,
   (f) $\lim\limits_{n\to\infty} \operatorname{arctg}\left(\frac{n^2+1}{n}\right)$,
   (g) $\lim\limits_{n\to\infty} \frac{4^{n-1}-5}{2^{2n}-7}$,
   (h) $\lim\limits_{n\to\infty} \frac{5\cdot 3^{2n}-1}{4\cdot 9^n+7}$,
   (i) $\lim\limits_{n\to\infty} \frac{3\cdot 2^{2^{n+2}}-10}{5\cdot 4^{n-1}+3}$.
4. Oblicz granice:
   (a) $\lim\limits_{n\to\infty} \left(1+\frac{2}{n}\right)^n$,
   (b) $\lim\limits_{n\to\infty} \left(\frac{n+5}{n}\right)^n$,
   (c) $\lim\limits_{n\to\infty} \left(\frac{3n-1}{3n+1}\right)^{n+4}$,
   (d) $\lim\limits_{n\to\infty} \left(\frac{5n-2}{4n+1}\right)^{-2n+9}$,
   (e) $\lim\limits_{n\to\infty} \left(\frac{n^2-1}{n^2+2}\right)^{3n^2-4}$,
   (f) $\lim\limits_{n\to\infty} \left(\frac{n^2-6}{2n^2+3}\right)^{n^2}$,
   (g) $\lim\limits_{n\to\infty} \left(\frac{-6n+9}{-6n-2}\right)^{-8n+34}$,
   (h) $\lim\limits_{n\to\infty} n(\ln(n+1)-\ln n)$.