

ANALIZA MATEMATYCZNA

LISTA ZADAŃ 6

5.11.18

(1) Znajdź promień zbieżności szeregów potęgowych:

(a)  $\sum_{n=1}^{\infty} \frac{\binom{3n}{n} x^n}{n^2},$

(b)  $\sum_{n=1}^{\infty} \frac{2^{n+7} x^{6n}}{\sqrt{n}},$

(c)  $\sum_{n=1}^{\infty} \frac{(54n+1)^n x^{3n}}{(81n+2)^n},$

(d)  $\sum_{n=1}^{\infty} 10^{n^2} x^{n^3},$

(e)  $\sum_{n=1}^{\infty} n! x^{2^n},$

(f)  $\sum_{n=1}^{\infty} \frac{10^n x^n}{n^{10}},$

(g)  $\sum_{n=1}^{\infty} \frac{x^n}{n 10^{n-1}},$

(h)  $\sum_{n=1}^{\infty} 50^n x^{2n+5},$

(i)  $\sum_{n=1}^{\infty} \frac{x^n}{n(n+1)},$

(j)  $\sum_{n=1}^{\infty} \frac{x^{2n}}{\sqrt{n^2+n-n}},$

(k)  $\sum_{n=1}^{\infty} \frac{4^{n+5} x^{3n+7}}{n 6^{2n}},$

(l)  $\sum_{n=1}^{\infty} \frac{(2n)! x^n}{(n!)^3},$

(m)  $\sum_{n=1}^{\infty} \frac{n!}{n^n} x^{n+7},$

(o)  $\sum_{n=1}^{\infty} \binom{4n}{n} x^n,$

(p)  $\sum_{n=1}^{\infty} n! x^{n^2},$

(q)  $\sum_{n=1}^{\infty} \binom{n+10}{n} x^n,$

(r)  $\sum_{n=1}^{\infty} \frac{n! (3n)!}{(2n)! (2n)!} x^n,$

(2) Znajdź granice:

(a)  $\lim_{x \rightarrow 7} \left( \frac{1}{x-7} - \frac{8}{x^2-6x-7} \right),$

(b)  $\lim_{x \rightarrow 0} x \sin \left( \frac{1}{x} \right),$

(c)  $\lim_{x \rightarrow 4} \frac{\sqrt{x}-2}{x-4},$

(d)  $\lim_{x \rightarrow 3} \frac{x-3}{x+2},$

(e)  $\lim_{x \rightarrow 5} \frac{x^2-6x+5}{x-5},$

(f)  $\lim_{x \rightarrow 1} \left( \frac{1}{1-x} - \frac{3}{1-x^3} \right),$

(g)  $\lim_{x \rightarrow 1} \frac{x^{2007}-1}{x^{10}-1},$

(h)  $\lim_{x \rightarrow 1/2} \frac{8x^3-1}{6x^2-5x+1},$

(i)  $\lim_{x \rightarrow -2} \frac{x^3+3x^2+2x}{x^2-x-6},$

(j)  $\lim_{x \rightarrow 0^+} \frac{x-\sqrt{x}}{\sqrt{x}},$

(k)  $\lim_{x \rightarrow 1} \frac{(x-1)\sqrt{2-x}}{x^2-1},$