

SZEREGI POTĘGOWE I GRANICA FUNKCJI

1. Znaleźć promień zbieżności szeregów potęgowych:

$$\begin{aligned}
& \sum_{n=1}^{\infty} \frac{\binom{3n}{n} x^n}{n^2}; & \sum_{n=1}^{\infty} \frac{2^{n+7} x^{6n}}{\sqrt{n}}; & \sum_{n=1}^{\infty} \frac{(54n+1)^n x^{3n}}{(81n+2)^n}; & \sum_{n=1}^{\infty} 10^{n^2} x^{n^3}; & \sum_{n=1}^{\infty} n! x^{2^n}; \\
& \sum_{n=1}^{\infty} \frac{10^n x^n}{n^{10}}; & \sum_{n=1}^{\infty} \frac{x^n}{n 10^{n-1}}; & \sum_{n=1}^{\infty} 50^n x^{2n+5}; & \sum_{n=1}^{\infty} \frac{x^n}{n(n+1)}; & \sum_{n=1}^{\infty} \frac{x^{2n}}{\sqrt{n^2+n-n}}; \\
& \sum_{n=1}^{\infty} \frac{4^{n+5} x^{3n+7}}{n 6^{2n}}; & \sum_{n=1}^{\infty} \frac{(2n)! x^n}{(n!)^3}; & \sum_{n=1}^{\infty} \frac{n!}{n^n} x^{n+7}; & \sum_{n=1}^{\infty} \binom{4n}{n} x^n; & \sum_{n=1}^{\infty} n! x^{n^2}; \\
& \sum_{n=1}^{\infty} \binom{n+10}{n} x^n; & \sum_{n=1}^{\infty} \frac{n!(3n)!}{(2n)!(2n)!} x^n;
\end{aligned}$$

2. Znaleźć granice:

$$\begin{aligned}
& \lim_{x \rightarrow 7} \left(\frac{1}{x-7} - \frac{8}{x^2-6x-7} \right); & \lim_{x \rightarrow 0} x \sin \frac{1}{x}; & \lim_{x \rightarrow 4} \frac{\sqrt{x}-2}{x-4}; & \lim_{x \rightarrow 3} \frac{x-3}{x+2}; \\
& \lim_{x \rightarrow 5} \frac{x^2-6x+5}{x-5}; & \lim_{x \rightarrow 1} \left(\frac{1}{1-x} - \frac{3}{1-x^3} \right); & \lim_{x \rightarrow 1} \frac{x^{2007}-1}{x^{10}-1}; & \lim_{x \rightarrow 1/2} \frac{8x^3-1}{6x^2-5x+1}; \\
& \lim_{x \rightarrow -2} \frac{x^3+3x^2+2x}{x^2-x-6}; & \lim_{x \rightarrow 0} \frac{x-\sqrt{x}}{\sqrt{x}}; & \lim_{x \rightarrow 1} \frac{(x-1)\sqrt{2-x}}{x^2-1};
\end{aligned}$$