

Review Practice Problems

- 1) Show that $\sum_{n=0}^{\infty} \frac{1}{1+n^2}$ is convergent.
- 2) Find $\lim_{n \rightarrow \infty} \frac{(6n^2+2n+4)^5}{n^{10}}$.
- 3) Are $\sum_{n=0}^{\infty} \frac{2^n n^2 + 6n}{5+3^n n^2}$ and $\sum \frac{n^4+2n^2}{n^5+6}$ convergent or divergent ?
- 4) Is $\sum_{n=0}^{\infty} \frac{4+5^n}{3+6^{n+1}}$ convergent or divergent ?
- 5) Find the radius of convergence of $\sum_{n=1}^{\infty} \frac{2^n}{n} (x-1)^n$
- 6) Show that $\sum_{n=1}^{\infty} \frac{(n^5+3)^n}{(3n^5+7)^n}$ is absolutely convergent.
- 7) Find the radius of convergence of $\sum_{n=1}^{\infty} \frac{6^n}{n^3} (x-3)^n$.
- 8) Find the terms of degree ≤ 3 of $x \ln(x)$ around $x = e$.
- 9) Is $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n-1}/2}$ convergent or divergent ?
- 10) Expand $x^2/(1+x^5)$, $\ln(3+2x)$ and $4x/(1-x)^2$ as power series.
- 11) Is $\sum_{n=1}^{\infty} \frac{n^{3/2}+5}{n^3}$ convergent or divergent ?
- 12) Are the series $\sum_{n=2}^{\infty} \frac{1}{(2n)!}$ and $\sum_{n=0}^{\infty} \frac{3^n}{(2n)!}$ convergent or divergent ?
- 13) Is $\sum_{n=0}^{\infty} \frac{2^n+5}{3^n+2}$ convergent or divergent ?
- 14) Is $\sum_{n=0}^{\infty} \frac{2^n(n+1)^n}{n^n}$ convergent or divergent ?
- 15) Is $\sum_{n=1}^{\infty} (-1)^n \frac{n^3+3}{n^3+1}$ convergent or divergent ?
- 16) Find the radius of convergence of $\sum_{n=0}^{\infty} \frac{n^2}{4^n} (x-6)^n$. (4)
- 17) Is the series $\sum_n (-1)^n/n$ absolutely convergent, conditionally convergent or divergent ? What about $\sum_n (-1)^n \frac{1}{n \ln^2(x)}$? (First: CC, Second: AC)
- 18) Is $\sum_n \frac{n^{10}+7}{6n^3+n^{11}}$ absolutely convergent, conditionally convergent or divergent ? (D)