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11.6 1a. diverges

b. converges

c. diverges

6. conditionally convergent

24 $\sum_{n=1}^{\infty} (-1)^n \frac{2^n n!}{3n+2}$

$\left| \frac{\frac{(-1)^{n+1} 2^{n+1} (n+1)!}{3(n+1)+2}}{\frac{(-1)^n 2^n n!}{3n+2}} \right| \quad \frac{(-1)^{n+1} 2^{n+1} (n+1)!}{(-1)^n 2^n n!} \cdot \frac{3n+2}{3(n+1)+2}$

$-2(n+1) \cdot \frac{3n+2}{3n+5}$

$\frac{-2(n+1)(3+\frac{2}{n})}{3n+5} \quad 2(3n+3+3+\frac{3}{n}) \quad \frac{6n+12+\frac{6}{n}}{3n+5}$

$\frac{n(6+\frac{12}{n}+\frac{6}{n^2})}{n(3+\frac{5}{n})} \to \frac{6}{3} \to 2 \geq 1$ diverges

26. $\sum_{n=1}^{\infty} \sqrt[n]{\left|\frac{(-2)^n}{n^n}\right|} \to \left|\frac{-2}{n}\right|$ $p \leq 1$ diverges

34.

11.7 6. $\sum_{n=1}^{\infty} \frac{n^{2n}}{(1+n)^{3n}}$ $\sqrt[n]{\left|\frac{n^{2n}}{(1+n)^{3n}}\right|} \to \frac{n^2}{(1+n)^3} \to \frac{n^2}{n^3+3n^2+3n+1}$

$\frac{n^2}{n^2(n+3+\frac{3}{n}+\frac{1}{n^2})} \to \frac{1}{n+3} \quad \frac{1/n}{1/n} \quad \frac{1/n}{1+\frac{3}{n}} = \frac{0}{1} =$ convergense

10. $\sum_{n=1}^{\infty} \frac{n^2}{e^{n^3}}$ $\left| \frac{\frac{(n+1)^2}{e^{(n+1)^3}}}{\frac{n^2}{e^{n^3}}} \right|$ $\frac{(n+1)^2}{n^2} \cdot \frac{e^{n^3}}{e^{(n+1)^3}} \to e^{n^3-(n+1)^3}$

$\frac{n^2+2n+1}{n^2} \to \frac{n^2(1+\frac{2}{n}+\frac{1}{n^2})}{n^2} \to 1$

$e^{-3n^2+3n+1} < 1$ converges

14 $\sum_{n=1}^{\infty} \frac{\sin 2n}{1+2^n}$ $\frac{1}{1+2^n} < \frac{1^n}{2^n}$ $(\frac{1}{2})^n$ $\frac{1}{2}(\frac{1}{2})^{n-1}$ $\frac{\frac{1}{2}}{1-\frac{1}{2}} = 1$

converges

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22. $\sum_{k=1}^{\infty} \frac{1}{2+\sin k}$ $\lim_{k\to\infty} \frac{1}{2+\sin k} \neq 0$ diverges

$(1,-1)$ $2 > 1 > -1$

11.8 4. $\sum_{n=1}^{\infty} \frac{(-1)^n x^n}{n^{1/3}}$ $R=0$ $I=\{c\}$ $c=0$ $\frac{\frac{(-1)^{n+1} x^{n+1}}{(n+1)^{1/3}}}{\frac{(-1)^n x^n}{n^{1/3}}}$

$\left| \frac{(-1)^n \cdot (-1) \cdot x^n \cdot x}{(-1)^n \cdot x^n} \cdot \frac{n^{1/3}}{(n+1)^{1/3}} \right|$ $\sqrt[3]{\frac{n}{n+1}} \to \frac{n(1)}{n(1+\frac{1}{n})} \to 1$

$\lim_{n\to\infty} |x| \cdot 1 \to x$

8. $\sum_{n=1}^{\infty} n^n x^n$ $\sqrt[n]{n^n x^n} \to |n||x|$ $\lim_{n\to\infty} n|x| \to \infty$