Indian Institute of Technology Delhi - Abu Dhabi

AMTL100: CALCULUS

Tutorial Sheet 6

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(1) Use the Ratio Test to determine whether each series converges absolutely or diverges.

(i) $\sum_{n=1}^{\infty} \frac{2^n}{n!}$

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

(iii) $\sum_{n=1}^{\infty} \frac{3^{n+2}}{\ln n}$

(iv) $\sum_{n=1}^{\infty} \frac{n5^n}{(2n+3)\ln(n+1)}$

(2) Use the Root Test to determine whether each series converges absolutely or diverges.

(i) $\sum_{n=1}^{\infty} \frac{7}{(2n+5)^n}$

(ii) $\sum_{n=1}^{\infty} \frac{4^n}{(3n)^n}$

(iii) $\sum_{n=1}^{\infty} (\frac{4n+3}{3n-5})^n$

(iv) $\sum_{n=1}^{\infty} (-1)^n (1 - \frac{1}{n})^{n^2}$

(v) $\sum_{n=1}^{\infty} \frac{1}{n^{1+n}}$

(3) Determine whether the alternating series converges or diverges.

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

(ii) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^2+5}{n^2+4}$

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

(iv) $\sum_{n=1}^{\infty} (-1)^n \frac{10^n}{(n+1)!}$

(v) $\sum_{n=1}^{\infty} (-1)^n \frac{\ln n}{n}$