

Math 1B Discussion Problems 21 Mar

1. Determine whether the following series are convergent or divergent.

(a) $\sum_{n=1}^{\infty} \frac{1}{n^2} \sin \frac{\pi}{n}$

(b) $\sum_{n=1}^{\infty} \frac{(\sqrt{2} + \sin n)^n}{3^n}$

(c) $\sum_{n=1}^{\infty} \frac{\cos(n\pi)}{\sqrt[n]{n}}$

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

2. Find the interval of convergence of the following power series.

(a) $\sum_{n=0}^{\infty} \frac{(x+1)^n}{1+2^n}$

(b) $\sum_{n=0}^{\infty} \frac{(2x-1)^n}{3n^2}$

3. Find the Maclaurin series of the following functions.

(a) $\sqrt[3]{27 + x^2}$

(b) $\ln\left(\sqrt{\frac{1+x}{1-x}}\right)$

(c) $x \tan^{-1} x + \sqrt{1 - x^2}$