

1. Find the interval of convergence of each of the following power series:

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

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

iii)  $\sum_{n=1}^{\infty} \frac{(1-3x)^n}{n}$ .

2. Estimate  $\sqrt[3]{9}$  with an error of magnitude less than  $10^{-4}$ . (Hint:  $\sqrt[3]{9} = (8+1)^{\frac{1}{3}} = 2\left(1 + \frac{1}{8}\right)^{\frac{1}{3}}$ .)
3. Use series to estimate the integral' value

$$\int_0^{0.1} \frac{1}{\sqrt{1+x^4}} dx$$

with an error of magnitude less than  $10^{-8}$ .

4. Let  $f(x) = \sqrt[5]{1+x^3}$ . Find  $f^{(30)}(0)$ .