Maclaurin Series Overview (2/6/21)

Q1 [6 marks]

Find the 1st 3 non-zero terms of the Maclaurin expansion of $ln\left(\frac{\sqrt{1+3x}}{1-2x}\right)$, and the interval of validity of the infinite series.

Q2 [Practice/E]

Find a Maclaurin expansion (with 3 non-zero terms) for $sin^2 x$ by two methods.

Q3 [Practice/M]

Find the 1st 3 non-zero terms of the Maclaurin expansions of the following functions, and the intervals of validity of the infinite series:

(i) $\ln(3-2x)$

(ii) $ln\left(\frac{\sqrt{1+3x}}{1-2x}\right)$

(iii) e^{cosx}

Q4 [Problem/M]

Use the 1st 5 terms of a Maclaurin expansion to find an approximate value for $P(Z<1)$, where $Z \sim N(0,1)$ and Z has pdf

$f(z) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}z^2\right)$

Q5 [Practice/M]

Use 3 terms of a Maclaurin expansion of $ln\left(\frac{1+x}{1-x}\right)$ to find an approximate value for ln $(\frac{2}{3})$

Q6 [Practice/M]

Find the first 3 non-zero terms, as well as the general term in the Maclaurin expansion of $cosh^3 x$.