Math 1B Discussion Problems 19 Mar

1. Find the Taylor series of $f(x)$ at $x = a$.

   (a) $f(x) = xe^x, a = 0$

   (b) $f(x) = x^3 - 2x + 4, a = 2$

   (c) $f(x) = 2^x, a = 1$

   (d) $f(x) = \sqrt[3]{8 + x}, a = 0$ (Hint: Use binomial series)

2. Find the first 3 nonzero terms in the Maclaurin series for each function.

   (a) $e^{-x^2} \cos x$

   (b) $(\tan^{-1} x)^2$

3. Find the sum of the following series.

   (a) $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{3^n}{n5^n}$

   (b) $\sum_{n=1}^{\infty} \frac{3^n}{5^n n!}$