1 5 points

(a) Show that

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

converges for all x.

(b) Differentiate term by term in the sum of (a). Is that sum converges for all x?

2 5 points

Find the first three nonzero terms of the Maclaurin series for

$$\frac{\ln(1+x)}{1-x}, \quad |x| < 1$$