

Name:

Section: 7 8

1. Using the Maclaurin series

$$\sin(x) = \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!},$$

(a) Find a Maclaurin series for $x^2 \sin(x)$.

(b) Find the sum of the series

$$\frac{\pi}{4} - \frac{\pi^3}{4^3 \cdot 3!} + \frac{\pi^5}{4^5 \cdot 5!} - \frac{\pi^7}{4^7 \cdot 7!} + \cdots$$

2. Find the Maclaurin series for $f(x) = \frac{1}{(1-x)^2}$ by using the definition of a Maclaurin series.