

Directions: Show all work on a separate sheet of paper for full credit.

1. Use the definition of a Taylor Series to find the first four nonzero terms of the series for $f(x)$ centered at a .

(a) $f(x) = \frac{1}{1+x}$, $a = 2$

(b) $f(x) = \sqrt[3]{x}$, $a = 8$

(c) $f(x) = \sin(x)$, $a = \pi/6$

(d) $f(x) = \ln x$, $a = 1$

2. Find the Maclaurin series for $f(x)$.

(a) $f(x) = (1 - x)^{-2}$

(b) $f(x) = 2^x$

3. Find the Taylor series of $f(x) = \frac{1}{x}$ centered at $a = -3$.

4. Use the Maclaurin series for $\sin x = \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!} x^{2n+1}$ to find the Maclaurin series for $f(x) = \sin(\pi x/4)$