

Name:

Section: 5 6 9 10

1. Find the Taylor polynomial of order 3 for each of the following functions at the specified center.

(a) $f(x) = \sqrt{1+x}$ at $a = 0$.

(b) $f(x) = \sin(2x)$ at $a = \pi/3$.

2. Using the Maclaurin series

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

- (a) Find a Maclaurin series for $x^3 \cos(2x)$
(b) Find the sum of the series

$$1 - \frac{\pi^2}{6^2 \cdot 2!} + \frac{\pi^4}{6^4 \cdot 4!} - \frac{\pi^6}{6^6 \cdot 6!} + \cdots$$