

University of Bahrain
Department of Mathematics
MATHS122: Calculus II
Spring 2016
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Worksheet 12: Taylor Series

Students' Name: _____

1. Find the Maclaurin series for $f(x) = \tan x$.

2. Find the Taylor series for $f(x) = \sin x$ at $a = \frac{\pi}{2}$.

3. Find the Maclaurin series for $f(x) = \sin^2 x$.
(Hint: Use double angle formula)

4. Find the Macluarin series for the function $f(x) = \sqrt{1+x^2} - \sqrt{1-x^2}$.

5. Consider the function $f(x) = \sqrt{1+x^2}$.

1. Write out the first four terms of the series representation of $f(x)$.

2. What is the maximum error if the first three terms are used to approximate $f(x)$ for $0 < x < \frac{1}{2}$.

6. In many applications, the **error function** is important. It is given by

$$e(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-t^2} dt$$

Find the first four non-zero terms of the error function $e(x)$.