

## MATH 1552, Integral Calculus

Sections 10.8, 10.9: Taylor Series

1. Use the MacLaurin series for  $f(x) = \frac{1}{1-x}$  to find a power series representation of the function

$$g(x) = \frac{x}{(1-x)^3}.$$

HINT: You will need to differentiate.

2. Find  $f^{(7)}(0)$  for the function  $f(x) = x \sin(x^2)$ .

3. Find a power series (i.e., MacLaurin series) representation for the following functions.

When is your series valid?

(a)  $f(x) = \frac{3x}{2+4x}$

(b)  $g(x) = xe^{-x}$