Name:________________________

Notesheet. Section 11.6 Part II: More Taylor Series

Math 1220

Theorem 1. Given a function $f(x)$ such that $f(x) = \sum_{n=0}^{\infty} a_n x^n$ on some interval I, then

(a) $\frac{d}{dx} f(x) =$

(b) $\int f(x)\ dx =$

Challenge 2. Find the Maclaurin series of the following series using the theorem above.

(a) $\frac{1}{(1-2x)^2}$. (Hint: use what you know from challenges 5 and 7 on the "11.1+11.6" notesheet.)

(b) $\ln(1+x^2)$ from the power series for $\frac{x}{1+x^2}$.

Challenge 3. Sometimes you can "recenter" a Taylor series.

(a) Find the Taylor series of e^x at $x = 1$ using the Maclaurin series $e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$

(b) Find the Taylor series of $\ln(2 + 3x)$ at $x = 10$

(c) Find the Taylor series of $\frac{x+5}{2+3x}$ at $x = -5$

(d) Find the Taylor series of $\frac{2}{x}$ at $x = 2$