Name:_____

Notesheet. Sections 11.1+11.6: Taylor Polynomials and More Taylor Series

Math 1220

Definition 1. The Nth Taylor polynomial $P_N(x)$ of $f(x)$ at $x = a$ is

Challenge 2. Find the 2nd Taylor polynomial of $f(x) = e^x$ at $x = 0$ and use it to approximate the decimal value of e.

Challenge 3. Find $P_2(x)$ for $f(x) = e^{-\frac{1}{2}x^2}$ at $x = 0$. Use $P_2(x)$ to approximate $P(0 < Z < 1)$ for standard normal RV Z.

Theorem 4. If $f(x) = \sum a_n x^n$ on interval of convergence $(-R < x < R)$, then

$$f(u(x)) =$$

Challenge 5. Find the Maclaurin series of the following functions and their intervals of convergence

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

(b) $f(x) = e^{x^5}$

Theorem 6. If $f(x) = \sum a_n x^n$ on interval of convergence I, then

$$x^p f(x) =$$

Challenge 7. Find the Maclaurin series of the following functions and their intervals of convergence

(a) $f(x) = \dfrac{x^3}{1-2x}$

(b) $f(x) = \dfrac{\ln(x+1)}{x}$