Math 16C
Kouba
Worksheet 10

1.) Use any method (repeated differentiation method or short cuts using well known Maclaurin series) to find the first four nonzero terms of the Taylor series centered at c for each of the following functions.

a.) $f(x) = x^2 + 3 + \sin(x^2)$ and $c = 0$

b.) $f(x) = e^{-x} - \cos\sqrt{x}$ and $c = 0$

c.) $f(x) = x^3 \cos 2x$ and $c = 0$

d.) $f(x) = (1 + x + x^2) \cdot \ln(1 + x)$ and $c = 0$

e.) $f(x) = \dfrac{x^5}{1 - 2x^3}$ and $c = 0$

f.) $f(x) = x + \sqrt{x + 4}$ and $c = -3$

g.) $f(x) = \tan(\pi x/4)$ and $c = 1$

2.) Determine the common function represented by (equal to) each of the following Taylor series.

a.) $1 + x + x^2/2! + x^3/3! + x^4/4! + \cdots$

b.) $x^2 + x^3 + x^4/2! + x^5/3! + x^6/4! + \cdots$

c.) $1 + x + x^2 + x^3 + x^4 + x^5 + \cdots$

d.) $x^4 - x^6 + x^8 - x^{10} + x^{12} - \cdots$