List of suggested exercises, updated, Sections 10.1-4
For the DGDs of July 3rd, 5th and July 10th, 12th.

Section 10.2

(1) Find the first four non-zero terms of the Taylor series for the function about 0, and gives the radius of convergence. Deduce the value of the fourth derivative at 0.

(#1) $(1+x)^{3/2}$ (#2) $\sqrt[4]{x+1}$ (#3) $\sin(-x)$

(#4) $\ln(1-x)$ (#6) $\dfrac{1}{\sqrt{1+x}}$

(2) Find the first four non-zero terms of the Taylot series for the function about the given a:

(#9) $\sin(x)$ $a=\pi/4$

(#12) $\tan(x)$ $a=\pi/4$

(#14) $\dfrac{1}{x}$ $a=2$

(3) By recognizing each series as a Taylor series evaluated at a particular x, find the sum of the following convergent series:

(#32) $1-\dfrac{1}{3!}+\dfrac{1}{5!}-\dfrac{1}{7!}+\cdots+\dfrac{(-1)^n}{(2n+1)!}$

(#37) $1+3+\dfrac{9}{2!}+\dfrac{27}{3!}+\dfrac{81}{4!}+\cdots$

(#39) $1-0.1+\dfrac{0.01}{2!}-\dfrac{0.001}{3!}+\cdots$

Section 10.3

(1) Find the first four non-zero terms of the Taylor series about 0 for the following functions. Find the value of the first, second, third and fourth derivative at 0.

(#2) $\cos(\theta^2)$ (#15) $\dfrac{1}{\sqrt{1-x^2}}$ (#5) $\arcsin(x)$

(#11) $\sqrt{1+t}\sin(t)$ (#12) $e^t\cos(t)$ $\dfrac{1}{1+\sin(x)}$

$x^2\arcsin(x^2)$ $\dfrac{1}{\sqrt{5-3x}}$ $(t+1)\sin(t)$

Section 10.4

Find a reasonnable error bound for the error in approximating the following numbers, using a third-degree Taylor poynomial about 0:

(#1) $e^{0.1}$ (#5) $\ln(1.5)$ (#7) $\tan(1)$ (#6) $1/\sqrt{3}$