Suggested Review Exercises

(1) Use the geometric series to find complete power series representations for

a.) $f(x) = \frac{1}{1-x}$

b.) $f(x) = \frac{1}{6-x^2}$

c.) $f(x) = \frac{x}{2-x^5}$

d.) $f(x) = \ln(1+x)$

e.) $f(x) = \ln(1+x^4)$

f.) $f(x) = \frac{1}{(1+x)^2}$

g.) $f(x) = \ln\sqrt{1-x^2}$

(2) Find the power series rep. for:

a.) $\int \frac{x}{2-x^5}\,dx$

b.) $\int \ln(1+x^4)\,dx$

c.) $\int x^3\cos(x)\,dx$

(3) Find powerseries expansion about zero for

a.) $x^2\sin(x)$

b.) $x^2 e^{-x}$

c.) $\sin(2x+3)$

d.) $x\cos(x+\pi)$

e.) $\sqrt{1+x^3}$

f.) $x^3\sqrt{1+x^3}$

g.) $\frac{1}{(3-x)^{3/2}}$

h.) $\cosh(x+2)$

(just first few terms)

$f(x) = \sqrt{\sin^2(x)+x^2}$ about $a=\pi$

(4) Find Taylor series for $\sqrt{x}$ centered at $a=1$

(Draft of Review 3)

(1) For I.O.C. and R.O.C. need to know
   a.) ratio test
   b.) for end points ⟵ n^{th} term, p-series, A.S.T., geometric
   c.) geometric series conv/div.

(2) Geometric Series Tricks.
   a.) $\frac{a}{1-r} = f(x)$ directly
   b.) $f'(x) = \frac{a}{1-r}$, trick
   c.) $\int f(x)dx = \frac{a}{1-r}$ tricky.
   d.) adding / subtracting them

(3) Known MacClaurin Series Subst. Need
   a.) to know e^x, $\sin(x)$, $\cos(x)$, $(1+x)^k$. (just 1st three terms.)
Also need to know precalculus.
   a.) xe^{x^2}
   b.) $x\cos(x)$
   c.) e^{x+2}
   d.) $xe^x\cos(x)$
   e.) $\sin(x+3)$
   f.) x^3e^{-x}

(4) What is a power series sol'n to an integral?
   a.) $\int \frac{\sin x}{x}\,dx$ (find complete)
   b.) $\int \tan(x^7)\,dx$ (1st three terms)
   c.) $\int x^{17}e^{-x}\,dx$ (1st 3 terms) & (complete)

(5) Know A.S.T. Error bound.