Section 10.5

1. For the following power series, find the radius and interval of convergence.

a.) $\sum_{n=1}^{\infty} \frac{(-4)^n x^n}{n^2+5}$

b.) $\sum_{n=1}^{\infty} \frac{(-2)^n(3x-1)^n}{\sqrt{n}}$

c.) $\sum_{n=0}^{\infty} \frac{(2n)!(x+2)^n}{100^n}$

d.) $\sum_{n=0}^{\infty} \frac{(x-1)^n}{(2n+1)!}$

e.) $\sum_{n=2}^{\infty} \dfrac{(-1)^n (x-1)^n}{2^n \ln n}$

2. Suppose it is known that $\sum_{n=0}^{\infty} c_n(x)^n$ converges when $x = -4$ and diverges when $x = 6$. What can be said about the convergence or divergence of the following series:

a.) $\sum_{n=0}^{\infty} c_n(8)^n$

b.) $\sum_{n=0}^{\infty} c_n(-3)^n$

c.) $\sum_{n=0}^{\infty} c_n$

d.) $\sum_{n=0}^{\infty} c_n(4)^n$

Section 10.6

3. Express the following functions as a power series. Identify the radius of convergence.

a.) $f(x) = \dfrac{1}{1-8x}$

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

c.) $f(x) = \dfrac{x^4}{5 - x}$

d.) $f(x) = \ln(x+15)$, **then** $g(x) = x^2 \ln(x+15)$

e.) $\boldsymbol{f(x) = \arctan(2x)}$

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

4. Express $\int_0^{1/2} \dfrac{1}{1+x^5}\,dx$ as an infinite series.

5. Evaluate $\int_0^{0.1} \dfrac{1}{1+x^3}\,dx$ with error less than 0.01.