Math 1411 **Worksheet 8**

Find the interval of convergence of the following power series:

1. $\sum_{n=0}^{\infty}(\frac{x}{10})^n$
2. $\sum_{n=0}^{\infty}\frac{nx^n}{n!}$
3. $\sum_{n=1}^{\infty}\frac{(x-2)^n}{2^n}$
4. $\sum_{n=1}^{\infty}\frac{n!x^n}{(2n)!}$
5. $\sum_{n=1}^{\infty}\frac{(-1)^n x^{2n+1}}{2n+1}$
6. $\sum_{n=1}^{\infty} n!x^n$

Find the power series around the specified center for the following functions

1. $\frac{1}{1-2x}$, center $c = 0$
2. $\frac{1}{1+x^2}$, center $c = 0$
3. $\frac{1}{(1-x)^2}$, center $c = 0$
4. $\frac{2x}{(1-x^2)^2}$, center $c = 0$
5. $\arctan(x)$, center $c = 0$
6. $\frac{1}{x}$, center $c = 1$

Find the Taylor series for the following functions, complete with radius of convergence, centered at the origin.

1. e^x
2. e^{x^2}
3. $x\sin(x)$
4. $x^2\cos(x^3)$
5. $e^x sin(x)$ (first three terms only)
6. $tan(x)$ (first three terms only)
7. $\int cos(t^2)dt$
8. $\int e^{x^2}dx$
9. $\int xe^{x^2}dx$