

This quiz is take-home, to be returned on Wednesday, April 16th. It has 5 questions of equal value and no partial credit.

1. Determine the center, radius of convergence and the interval of convergence for

$$\sum_{k=1}^{\infty} \frac{2^k (x-1)^k}{7^k k}$$

2. Evaluate the following limit (*Hint: use Taylor series*):

$$\lim_{x \rightarrow 0} \frac{\sin(x) - x}{x^3} = \underline{\hspace{4cm}}$$

3. What does  $\sum_{k=0}^{\infty} \frac{\ln(2)^k}{k!}$  converge to?

4. Find a power series representation for  $\frac{x}{(1+x)^2}$ .

5. Find a 4th degree Taylor polynomial for  $e^{x^2}$ . That is, if  $e^{x^2} = \sum_{k=0}^{\infty} a_k x^k$  on an interval around 0, write down

$$a_0 + a_1 x + a_2 x^2 + a_3 x^3 + a_4 x^4.$$