# Math 101 Tutorial Worksheet 8

There is an associated quiz due on BrightSpace on Tuesday, March 15 at 10:00 PM

1. Determine the interval of convergence of the power series:

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{(2x-1)^n}{5^n\sqrt{n}}$

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n x^n}{n^{1/3}}$

   (c) $\displaystyle\sum_{n=1}^{\infty} \frac{x^n}{5^n n^5}$

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n (x-3)^n}{2n+1}$

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{n!(2x-1)^n}{2}$

   (c) $\displaystyle\sum_{n=1}^{\infty} \frac{n}{4^n}(x+1)^n$

2. Suppose that the radius of convergence of the power series $\displaystyle\sum_n a_n x^n$ is $R$ where $0 < R < \infty$. Determine the radius of convergence of the power series $\displaystyle\sum_n a_n x^{2n}$.

3. Show that the function represented by the power series is a solution of the given differential equation.

$$y = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} \qquad \text{for} \qquad y'' + y = 0$$