

Quiz Date: October 30, 2017

Instructions: The following exercises are similar to those found in the course text book. This homework is not due for a grade, but you should know how to do all of them and be able to show your work for each. You can expect at least one of these problems to appear on an in-class quiz on the date listed above.

8.5 - Power Series

Find the radius and interval of convergence for the given power series.

1.
$$\sum_{n=0}^{\infty} \frac{x^n}{n!}$$

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

3.
$$\sum_{n=1}^{\infty} \frac{x^n}{n3^n}$$

4.
$$\sum_{n=1}^{\infty} n!(2x-1)^n$$

5.
$$\sum_{n=1}^{\infty} \frac{x^n}{1 \cdot 3 \cdot 5 \cdots (2n-1)}$$

8.6 - Representing Functions as Power Series

Find a power series representation for the function and determine the (open) interval of convergence.

6.
$$f(x) = \frac{1}{1+x}$$

7.
$$f(x) = \frac{x}{2x^2+1}$$

8.
$$f(x) = \ln(5-x)$$

9.
$$f(x) = \frac{1+x}{(1-x)^2}$$

10.
$$f(x) = \frac{3}{x^2-x-2}$$
 [HINT: consider partial fractions]