Quiz Date: November 13, 2018

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 the problems 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.

8.6 - Representing Functions as Power Series

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

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

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

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

8.7 - Taylor & Maclaurin Series

2. Find the Taylor series for $f(x)$ centered at the given value of a.

a. $f(x) = e^{2x},\ a = 3$

b. $f(x) = 1/x,\ a = -3$

3. Use series to evaluate the limit $\lim\limits_{x \to 0} \dfrac{x - \ln(1 + x)}{x^2}$.

4. Use series to approximate the following integral to 5 decimal places: $\displaystyle\int_0^{0.1} \frac{dx}{\sqrt{1 + x^3}}$

9.1 - Parametric Curves

5. Sketch the parametric curve using arrows to point in the direction of increasing parameter. Then eliminate the parameter to find the Cartesian equation of the curve.

a. $x = t^2 + 4t,\ y = 2 - t,\ -4 \le t \le 1$

b. $x = \cos\theta,\ y = \sec\theta,\ 0 \le \theta < \dfrac{\pi}{2}$

c. $x = 2\cos\theta,\ y = 1 + \sin\theta$