Math 8
Winter 2020

Preliminary Homework
Assigned Monday, January 6

Note: Preliminary homework is always graded credit or no credit. **You get full credit for completing the assignment, whether or not your answers are correct, as long as your work shows you have thought about the problem.** The purpose of preliminary homework is to start you thinking about the topic of the next class.

You may use your preliminary homework for in-class activities with your classmates. You should be sure to think about these questions so you will be prepared.

Preliminary homework is always due at the *beginning* of the next class.

1. Find the nth degree Taylor polynomial $T_n(x)$ for the function $f(x) = \dfrac{1}{1-x}$ centered at the point $a = 0$.

   Hint: It may be helpful to think of this as $f(x) = (1-x)^{-1}$.

   For the remaining problems, $T_n(x)$ will mean this polynomial, so do your very best to get this part right. Get help at tutorial, if necessary.

2. Find $T_n(x)$ for the following values of n and x.

   (a) $x = 1$ and $n = 0, 1, 2, 3$.

   (b) $x = -1$ and $n = 0, 1, 2, 3$.

   (c) $x = \frac{1}{2}$ and $n = 0, 1, 2, 3$.

3. What does each of the following approach (if anything) as $n \to \infty$? Why? (We haven't discussed limits of this sort yet, so think intuitively.)

   (a) $T_n(1)$.

   (b) $T_n(-1)$.

   (c) $T_n(\frac{1}{2})$.