SECTION 5.1: SEQUENCES

1. To know by the end of section 5.1:
   (a) what an infinite sequence is
   (b) how to read and use sequence notation
   (c) what it means to "Find a formula for the nth term", and how to find it
   (d) what it means for a sequence to converge or diverge
   (e) different limit techniques for determining if a sequence converges or diverges, including L'Hopital's rule
   (f) what $n!$ means
   (g) terms for describing a sequence: bounded, monotone, increasing, decreasing

2. For each sequence below, write the first 5 terms and graph them.
   (a) $\left\{\dfrac{n+2}{2n}\right\}_{n=1}^{\infty}$

   (b) $a_n = 3\left(\dfrac{-1}{2}\right)^{n-1}$ for $n \geq 1$

   (c) $a_1 = 5$ and $a_n = 2\,a_{n-1} + 1$

3. Find a formula for 2 (c).

4. Definition: The symbol $n!$ or "n factorial" means

   and $0! =$

5. Find the limit of each of the following sequences or show that it diverges.

   (a) $\left\{\pi + \dfrac{100}{n}\right\}$

   (b) $a_n = \dfrac{3^n}{n!}$

   (c) $\left\{\dfrac{100n^2 + \sqrt{n}}{n - 3n^2}\right\}$

   (d) $\left\{\dfrac{n^2}{10^n}\right\}$

   (e) $a_n = \left(1 + \dfrac{1}{n}\right)^n$

Now, go back to the examples in 2. Find the limit of each or show that it diverges.