The assignment is due at my office (Riley Hall, 205-J) by 3:30pm on Thursday, November 1.

1. For each integer $n \geq 1$, let $g_n$ denote the number of ways to write $n$ as a sum of 1’s, 2’s, and 3’s.
   (a) Find $g_1$, $g_2$, and $g_3$ by inspection.
   (b) For $n \geq 4$, find a recursive formula for $g_n$. Explain your formula.
   (c) Use your formula to find $g_{10}$. 
2. Let $a_1 = 1$ and, for $n \geq 2$, let $a_n = \sqrt{1 + a_{n-1}}$.

(a) Find $a_2$, $a_3$, and $a_4$. Express your answers as decimals. (Keep at least five decimal places of accuracy.)

(b) Show that the sequence is monotonic.

(c) Show that the sequence is bounded.

(d) Find the limit of the sequence.