Combinatorics. Quiz 6a. Name _____ Time_____

Show all work for full or partial credit. Put a box around your final answer in each part. Try the problem on your own before helping each other understand it.

1. a) Find the ordinary generating function $f(x)$ for the sequence a_n where a_n is the number of integer solutions of $e_1 + e_2 + e_3 + e_4 = n$ where $0 \le e_1 \le 5, 2 \le e_2 \le 5, 3 \le e_3 \le 4$ and $0 \le e_4$.

b) Use the ninth derivative of your above answer to find a_9. Use wolframalpha.com, with the command "$(d\hat{\;}9/dx\hat{\;}9)[f(x)]; x = 0$" and then divide by 9!. Turn in a screen shot.

c) Find a_9 using inclusion-exclusion.