Math 152 – Summer 2013
Quiz 3 - June 18, 2013 Name: ______________________________

This quiz requires some computational work.

1. (*6 points*) For $n \geq 1$, let $f(n) = \dfrac{(n+1)n}{2}$. Completely simplify the expression $\sum_{m=3}^{5} (-1)^{f(m)}$.

2. (*8 points*) Let $\{a_n\}$ be recursively defined as $a_0 = 0$ and $a_n = 2a_{n-1} + 1$ for all $n \geq 1$. Then for all $n \geq 0$, let $\{S_n\}$ be defined as $S_n = \sum_{k=0}^{n} a_k$ (for instance we have $S_0 = \sum_{k=0}^{0} a_k$ and $S_5 = \sum_{k=0}^{5} a_k$). Complete this table. (Hint: fill out the column for a_n first.)

n	a_n	S_n
0	0	0
1		
2		
3		
4		

3. (*6 points*) For all $k \geq 1$, let P_k be defined as $P_k = \dfrac{k^2 - 1}{2k^2 + k} + \dfrac{3^k}{k!}$. Does the sequence P_k converge? If so, find its limit.