

- **Show all your work.** Show it on this paper.
- No electronics, no notes, no book.

- (1) (4 pts) Simplify this infinite series: $f(x) = \sum_{n=0}^{\infty} \binom{n}{2} x^n$.
- (2) (4+4 pts) We want to make a fruit basket of n fruits. The basket should have an even number of Apples (0 is an even number), an odd number of Bananas, and at most 2 Cherries. Let h_n = the number of ways to make such a basket.
- (a) Construct the generating function for h_n .
 - (b) Simplify the generating function as much as possible.