Proof Portfolio Problem 7

Chose one problem from each numbered group. So, choose only one of 7A, 7B, and 7C.

As always, remind yourself of the academic honesty guidelines for the proof portfolio. *Please see me when you need support.*

The initial deadline for problems 5-8 is Monday, March 23 by 11:59PM, with the final deadline Friday, March 27 by 11:59PM.

Conjecture 7A. For all natural numbers n, $8 \mid 3^{2n} - 1$.

Conjecture 7B. Conjecture and prove a formula for the n^{th} derivative of $f(x) = e^{2x}$ for each $n \in \mathbb{N}$.

Conjecture 7C. Let f_n be the n^{th} Fibonacci number. For all natural numbers n,

$$f_2 + f_4 + \cdots + f_{2n} = f_{2n+1} - 1.$$