TOPIC 10: Sequences (Homework Problems):

1)
The sequence a_n is defined by $a_0 = a_1 = 1$ and $a_{n+1} = a_{n-1}a_n + 1$. Show that a_{2008} is not divisible by 4.

2)
The sequence a_n is defined by $a_1 = a_2 = 1$ and $a_{n+2} = (a_{n+1}^2 + 2)/a_n$. Show that all terms of the sequence are integers.

3)
The sequence a_n is defined by $a_1 = a_2 = 1$, $a_3 = -1$ and $a_{n+2} = a_{n+1}a_{n-1}$. Find a_{2009}.

4)
A sequence is defined by $a_1 = 1$, $a_2 = 12$, $a_3 = 20$ and $a_{n+3} = 2a_{n+2} + 2a_{n+1} - a_n$. Prove that for every positive integer n, $1 + 4a_na_{n+1}$ is a square.