

1. Solve:

a) $a_n = 5a_{n-1} - 6a_{n-2}$, $a_0 = 1$, $a_1 = 0$

b) $a_n = 2a_{n-1} - a_{n-2}$, $a_0 = 4$, $a_1 = 1$

c) $a_n = -6a_{n-1} - 8a_{n-2}$, $a_0 = 3$, $a_1 = 0$

2. The Lucas numbers satisfy $L_n = L_{n-1} + L_{n-2}$ with $L_0 = 2$ and $L_1 = 1$.

Show that $L_n = F_{n-1} + F_{n+1}$.

3. Prove $F_{n+1} = \binom{n}{0} + \binom{n-1}{1} + \dots + \binom{n-k}{k}$.

4. Find the solution to $a_n = 7a_{n-2} + 6a_{n-3}$ with $a_0 = 9$, $a_1 = 10$, $a_2 = 32$.