

Solve the following Recurrence relations. Write your answers on a separate paper.

1. $a_n = -a_{n-1} + 6a_{n-2}$, $n \geq 2$, $a_0 = -1$, $a_1 = 8$

2. $a_n = 5a_{n-1} + 6a_{n-2}$, $n \geq 2$, $a_0 = 1$, $a_1 = 3$

3. $a_n = \frac{11}{2}a_{n-1} - \frac{5}{2}a_{n-2}$, $n \geq 0$, $a_0 = 2$, $a_1 = -8$

4. $a_n = a_{n-2}$, $n \geq 2$, $a_0 = 0$, $a_1 = 3$

5. $a_n = 6a_{n-1} - 9a_{n-2}$, $n \geq 2$, $a_0 = 5$, $a_1 = 12$

6. $a_n = -3a_{n-1} - 2a_{n-2}$, $n \geq 2$, $a_0 = 1$, $a_1 = 3$

7. If $a_0 = 0$, $a_1 = 1$, $a_2 = 4$, and $a_3 = 37$ satisfy the recurrence relation $a_n + ba_{n-1} + ca_{n-2} = 0$, where $n \geq 0$ and b, c are constants, determine b, c , and solve for a_n .

8. For $n \geq 0$, let a_n count the number of ways a sequence of 1's and 2's will sum to n . For example, $a_3 = 3$ because (1) 1, 1, 1; (2) 1, 2; and (3) 2, 1 sum to 3. Find and solve a recurrence relation for a_n .