



Avaliação B 03 de Fundamentos de Matemática

Página 05 - Questões 01 (Valor 2,0)

1. Solve each of the following recurrence relations.

a) $a_{n+1} - a_n = 2n + 3, \quad n \geq 0, \quad a_0 = 1$

b) $a_{n+1} - a_n = 3n^2 - n, \quad n \geq 0, \quad a_0 = 3$

c) $a_{n+1} - 2a_n = 5, \quad n \geq 0, \quad a_0 = 1$

d) $a_{n+1} - 2a_n = 2^n, \quad n \geq 0, \quad a_0 = 1$

4. On the first day of a new year, Joseph deposits \$1000 in an account that pays 6% interest compounded monthly. At the beginning of each month he adds \$200 to his account. If he continues to do this for the next four years (so that he makes 47 additional deposits of \$200), how much will his account be worth exactly four years after he opened it?

In Exercises 11–26, solve the given recurrence relation for the initial conditions given.

15. $a_n = 6a_{n-1} - 8a_{n-2}; \quad a_0 = 1, \quad a_1 = 0$

16. $a_n = 2a_{n-1} + 8a_{n-2}; \quad a_0 = 4, \quad a_1 = 10$

17. $a_n = 7a_{n-1} - 10a_{n-2}; \quad a_0 = 5, \quad a_1 = 16$

18. $2a_n = 7a_{n-1} - 3a_{n-2}; \quad a_0 = a_1 = 1$

21. $a_n = -8a_{n-1} - 16a_{n-2}; \quad a_0 = 2, \quad a_1 = -20$

22. The Lucas sequence

$$L_n = L_{n-1} + L_{n-2}, \quad n \geq 3; \quad L_1 = 1, \quad L_2 = 3$$

23. $9a_n = 6a_{n-1} - a_{n-2}; \quad a_0 = 6, \quad a_1 = 5$