

$$a) \underline{a_n} = \underline{a_{n-1}} + 6 \underline{a_{n-2}} \quad n \geq 2$$

$$a_0 = 3 \quad a_1 = 6$$

Equação característica.

$$X^2 = X + 6$$

$$X^2 - X - 6 = 0$$

$$\Delta = b^2 - 4ac$$

$$\Delta = (-1)^2 - 4(1)(-6)$$

$$\Delta = 1 + 24 \Rightarrow \sqrt{\Delta} = 5$$

$$x' = \frac{-b + \sqrt{\Delta}}{2a} = \frac{-(-1) + 5}{2} = 3$$

$$x'' = \frac{-1 - 5}{2} = -2$$

$$x = 3 \quad x = -2$$

$$a_n = \alpha (3)^n + \beta (-2)^n$$

$$a_0 = \alpha 3 + \beta (-2)$$

$$3 = \alpha + \beta$$

$$a_1 = 3\alpha - 2\beta$$

$$6 = 3\alpha - 2\beta$$

$$\begin{cases} \alpha + \beta = 3 & | -3 \\ 3\alpha - 2\beta = 6 & | 1 \end{cases}$$

$$-3\alpha - 3\beta = -9$$

$$3\alpha - 2\beta = 6$$

$$-5\beta = -3$$

$$\beta = \frac{3}{5}$$

$$\alpha = -\frac{3}{5} + 3$$

$$\alpha = \frac{15 - 3}{5} = \alpha = \frac{12}{5}$$

$$a_n = \frac{12}{5} (3)^n + \frac{3}{5} (-2)^n$$

$$g) \underline{a_{n+2}} = -4 \underline{a_{n+1}} + 5 \underline{a_n}$$

$$n \geq 0$$

$$a_0 = 2 \quad a_1 = 8$$

$$X^2 = -4X + 5$$

$$X^2 + 4X - 5 = 0$$

$$x_1 = -5 \quad x_2 = 1$$

$$a_n = \alpha(-5)^n + \beta 1^n \quad | \quad \alpha + \beta = 2$$

$$a_0 = \alpha(-5)^0 + \beta 1^0$$

$$a_0 = \alpha + \beta$$

$$\alpha + \beta = 2 \quad (*)$$

$$a_1 = \alpha(-5)^1 + \beta 1^1$$

$$a_1 = -5\alpha + \beta$$

$$\begin{array}{r|l} \alpha + \beta = 2 & 5 \\ -5\alpha + \beta = 8 & 1 \end{array}$$

$$\begin{array}{r} 5\alpha + 5\beta = 10 \\ -5\alpha + \beta = 8 \end{array}$$

$$6\beta = 18$$

$$\beta = 3$$

$$\alpha + 3 = 2$$

$$\alpha = -1$$

$$a_n = -(-5)^n + 3 \times 1^n$$

$$a_n = -(-5)^n + 3$$

