(b) $y[m] - \frac{1}{2}y[m-1] + \frac{2}{7}y[m-2] = 5x[m-1] - 3x[m]$

$y[-1] = (2.5) = 10$; $y[-2] = (5-1) = 4$

(c) $y[m] - \frac{1}{2}y[m-1] + \frac{2}{7}y[m-2] = 0$

$r^2 + r + C = 0$

$r^2 - \frac{1}{2}r + \frac{2}{7} = 0$

$r_1 = 0.25 + j0.472 \rightarrow 0,534\, e^{j1,083}$

$r_2 = 0.25 - j0.472 \rightarrow 0,534\, e^{-j1,083}$

(d) $y_{natural}[m] = C_1 r_1^m + C_2 r_2^m$, considerando entrada nula $x[m] = 0$

$y[0] = \frac{1}{2}y[-1] - \frac{2}{7}y[-2] \Rightarrow y[0] = \frac{1}{2}\cdot 10 - \frac{2}{7}\cdot 4 = 3,857$

$y[1] = \frac{1}{2}y[0] - \frac{2}{7}y[-1] \Rightarrow y[1] = \frac{1}{2}\cdot 3,857 - \frac{2}{7}\cdot 10 = -0,928$

$$\begin{cases} C1 + C2 = 3,857 \\ (0.25+j0.472)C1 + (0.25-j0.472)C2 = -0,928 \end{cases}$$

$C2 = 3,857 - C1$

$(0.25+j0.472)C1 + (0.25-j0.472)(3,857-C1) = -0.928$

$(0.25+j0.472)C1 + 0.964 - j1,820 - C1(0.25-j0.472) = -0.928$

$C1(j0.944) + 0.964 - j1,820 = -0.928$

$C1 = \frac{-1,892 + j1.82}{j0,944} = 1,927 + j2,004 \Rightarrow 2,780\, e^{j0,804}$

$C2 = 3,857 - (1,927 + j2,004) = 1,93 - j2,004 \Rightarrow (\approx)$ aproxx $2,780\, e^{-j0,80}$

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$$y_{natural}[m] = 2{,}780\left(e^{j\,0{,}804}\cdot 0{,}534^{m}\cdot e^{j\,1{,}083m}\cdot e^{-j\,0{,}804}\cdot 0{,}534^{m}\cdot e^{-j\,1{,}083m} + e^{-j(0{,}804+1{,}083m)}\right)$$

$$y_{natural}[m] = 2{,}780\cdot 0{,}534^{m}\cdot\left(\underbrace{e^{j(0{,}804+1{,}083m)} + e^{-j(0{,}804+1{,}083m)}}_{\text{cosseno}}\right)$$

$$y_{natural}[m] = 2\cdot 2{,}780\cdot 0{,}534^{m}\cdot\cos(1{,}083m + 0{,}804)$$

2 → relação do cosseno; $0{,}534^{m}$ → $|r|$; $1{,}083m$ → ϕr

$$\boxed{y_{natural}[m] = 5{,}56\cdot 0{,}534^{m}\cdot\cos(1{,}083m + 0{,}804)}$$