

Juacinos  
Parciales  
Video 2

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$$X(s) = \frac{2s^3 + 8s^2 + 4s + 5}{s(s+1)(s^2+4s+5)}$$

$$\frac{H_1}{s} + \frac{H_2}{s+1} + \frac{A}{s+2+j2} + \frac{A^*}{s+2-j2}$$

$$H_1 = s \times X(s) \Big|_{s=0} = \frac{\cancel{s} 2\cancel{s}^0 3 + \cancel{s} 8\cancel{s}^0 2 + 4\cancel{s}^0 + 5}{\cancel{s}(s+1)(s^2+4s+5)} \Big|_{s=0} = \frac{1}{1} \rightarrow \boxed{H_1 = 1}$$

$$H_2 = (s+1)X(s) \Big|_{s=-1} = \frac{(s+1)(2s^3 + 8s^2 + 4s + 5)}{s(s+1)(s^2+4s+5)} \Big|_{s=-1}$$

$$H_2 = (s+1) \left( \frac{-2s^3 + 8s^2 + 4s + 8}{s(s+1)(s^2+4s+8)} \right) \Big|_{s=-1}$$

$$H_2 = \frac{-2 + 8 - 4 + 8}{-1(1 - 4 + 8)} = -\frac{10}{5} = -2$$

$$\boxed{H_2 = -2}$$

$$A = (s+2+j2)X(s) \Big|_{s=-2-j2}$$

$$A = (s+2+j2) \left( \frac{2s^3 + 8s^2 + 4s + 5}{s(s+1)(s^2+4s+8)} \right) \Big|_{s=-2-j2}$$

$$A = (s+2+j2) \left( \frac{2s^3 + 8s^2 + 4s + 5}{s(s+1)(s+2+j2)(s+2-j2)} \right) \Big|_{s=-2-j2}$$

$$A = \frac{2(-2-j2)^3 + 8(-2-j2) + 4(-2-j2) + 5}{(-2-j2)[(-2-j2)+1][(-2-j2)^2 + 4(-2-j2) + 8]}$$

resolvendo parte por parte:

$$2s^3 = 2[-2 - j2]^3$$

$$= 2[(-2)^3 + 3(-2)j^2(-j2) + 3(-2)(-j2)^2 + (-j2)^3]$$

$$(-j2)^3 = (-1)^3 j^3 2^3$$

$$= -1 j^3 8$$

$$= -8(-1j)$$

$$= j8$$

$$2s^3 = 2[-8 - j24 + 24 + j8]$$

$$2s^3 = 2[16 - j16]$$

$$\boxed{2s^3 = 32 - j32}$$

$$8s^2 = 8[-2 - j2]^2$$

$$8s^2 = 8[4 - j(4j) - 4]$$

$$8s^2 = 8[8j]$$

$$\boxed{8s^2 = j64}$$

numerador:

$$32 - j32 + j64 + 4(-2 - j2) + 8 + -8 - j8 + 8$$

$$\boxed{32 + j24}$$

denominador:

$$\begin{aligned} &(-2 - j2)(-2 - j2 + 1)(-2 - j2 + 2 - j2) \\ &(-2 - j2)(-2 - j2 + 1)(-j4) \\ &(j8 - 8)(-1 - j2) \\ &-j8 + 16 + 8 + j16 \end{aligned}$$

$$\boxed{24 + j8}$$

$$A = \frac{32 + j24}{24 + j8} = \frac{8(4 + j3)}{8(3 + j)} = \frac{4 + j3}{3 + j} \cdot \frac{3 - j}{3 - j} = \frac{12 - 4j + 9j + 3}{9 - j^2 + j3 - j3}$$

$$A = \frac{15 + 5j}{10} = \frac{3 + j}{2} = 1,5 + j0,5$$

$$\boxed{A = 1,5 + j0,5}$$

temos:

$$X(s) = \frac{1}{s} - \frac{2}{s+1} + \frac{1,5 + j0,5}{s+2+j2} + \frac{1,5 - j0,5}{s+2-j2}$$