Tarea 1 Vide 2

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

$$= \frac{K_1}{s} + \frac{K_2}{s+1} + \frac{A}{s+2+j2} + \frac{A^*}{s+2-j2}$$

$$K_1 = s\,X(s)\Big|_{s=0} \Rightarrow s\,\frac{2s^3 + 8s^2 + 4s + 8}{s(s+1)(s^2 + 4s + 8)}\Big|_{s=0}$$

$$K_1 = \frac{8}{8} = 1$$

Scribe

Para $K_2 = (s+1)X(s)\Big|_{s=-1}$

$= (s+1)\dfrac{2s^3+8s^2+4s+8}{s(s+1)(s^2+4s+8)}\Big|_{s=-1} = \dfrac{2(-1)^3+8(-1)^2+4(-1)+8}{(-1)((-1)^2+4(-1)+8)}$

$K_2 = \dfrac{-2+8-4+8}{-1(5)} = \dfrac{10}{-5} = -2 \quad K_1 = -2$

$\Rightarrow A = (s+2+j2)X(s)\Big|_{s=-2-j2} = (s+2+j2)\dfrac{2s^3+8s^2+4s+8}{s(s+1)(s^2+4s+8)}\Big|_{s=-}$

$A = (s+2+j2)\dfrac{2s^3+8s^2+4s+8}{s(s+1)(s+2+j2)(s+2-j2)}$

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

Por partes

$2s^3 = 2(-2-j2)^3 \qquad -j24$

$= 2((-2)^3+3(-2)^2(-j2)+3(-2)(-j2)^2+(-j2)^3) \qquad 24$

$(-j2)^3 = (-1)^3 j^3 2^3 = 1 j^2 j 8 = -8(-1)j = j8$

$2s^3 = 2(-8-j24+24+j8)$

$\boxed{2s^3 \quad 2(16-j16) = 32-j32}$

Para $8s^2 = 8(-2-j2)^2 \qquad A = \dfrac{2s^3+8s^2+4s+8}{s(s+1)(s+2-j2)} = A$

$8s^2 = j64$

Numerador

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

$52-j32+j64-j16$

$\boxed{32+j24}$

Denominador

$s(s+1)(s+1-j2) = (-2-j2)(-2-j2+1)(-2-j2+2+j2)$

$= 24+j8$

$A = \dfrac{32+j24}{24+j8} = \dfrac{8(4+j3)}{8(3+j)} = \dfrac{4+3j}{3+j}\cdot\dfrac{3-j}{3-j}$

$= \dfrac{15+j5}{10} \Rightarrow \boxed{A = 1,5+j0,5}$

$= \dfrac{1}{s} - \dfrac{2}{s+1} + \dfrac{1,5+j0,5}{s+2+j2} + \dfrac{1,5-j0,5}{s+2-j2}$