Transcripción #2

- Fracciones Parciales

$$X(s) = \frac{2s^3+8s^2+4s+8}{s(s+1)(s^2+4s+8)} = \frac{K_1}{s} + \frac{K_2}{s+1} + K_3$$

→ $$K_3 = \frac{A}{s+2+2j} + \frac{A^*}{s+2-2j}$$

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

→ $$K_2 = (s+1)X(s)\Big|_{s=-1} = \frac{(s+1)(2s^3+8s^2+4s+8)}{(s+1)(s)(s^2+4s+8)}$$

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

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

✓ Por partes

- $2s^3 = 2(-2-j2)^3 = 2((-2)^3+3(-2)^2(-j2)+3(-2)(j)^2+(-j2)^3)$

$$= 2((-2)^3 - j24 + 24 + j8) = 2(-8+24+8-j24) = 48-j48$$

$8s^2 = 8(-2-j2)^2 \longrightarrow 8s^2 = j64$

Numerador $= 32-j32+j64-j8 = 32+j24$

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

$= 24+j8$

$$A = \frac{32+j24}{20+j8} = \frac{4+j3}{3+j} = 1,5-0,5j$$

$$X(s) = \frac{1}{s} - \frac{2}{s+1} + \frac{1,5-0,5j}{s+2+j2} + \frac{1,5+0,5j}{s+2-j2}$$