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Tarea ~~#~~ Fracciones Parciales

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

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

$$K_1 = sX(s)\Big|_{s=0} \longrightarrow \boxed{K_1 = 1}$$

$$K_2 = (s+1)\,X_s\Big|_{s=-1} \longrightarrow \boxed{K_2 = -2}$$

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

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

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

Por partes

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

$$(-j2)^3 = (-1)^3\,j^3\,2^3$$
$$= -1\cdot j^2\cdot j\cdot 8$$
$$= j\cdot 8$$

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

$= 2[16 - j16]$

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

$8s^2 = 8(-2 - j2)^2$

$8s^2 = j64$

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

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

*Denominador:*

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

$24 + jB$

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

* Eliminar Complejo en el denominador.

$$A = \frac{4+j3}{3+j} \cdot \frac{3-j}{3-j} \longrightarrow \frac{15 - j5}{10}$$

$\boxed{A = 1{,}5 - j0{,}5.}$

$K_1 = 1$

$K_2 = -2$

$A = 1{,}5 - j0{,}5$

$A^* = 1{,}5 + j0{,}5$

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

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