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1. $x(t) = e^{-3t}u(t) + e^{2t}u(-t)$

a. $x(t) = e^{-3t}u(t) + e^{2t}u(-t)$

$x(t) = e^{-3t}u(t) - \left(-e^{-(-2)t}u(-t)\right)$

$x_1(t) = e^{-3t}u(t) \longleftrightarrow X_1(s) = \frac{1}{s+3}, \quad Re_1(s) > -3$

$x_2(t) = -e^{-(-2)t}u(-t) \longleftrightarrow X_2(s) = \frac{1}{s-2}, \quad Re_2(s) < 2$

$x(t) = x_1(t) - x_2(t)$

$X(s) = X_1(s) - X_2(s)$

$X(s) = \frac{1}{s+3} - \frac{1}{s-2} = -\frac{5}{s^2+s-6}$

b. $Re(s) \supset Re_1(s) \cap Re_2(s) \longrightarrow -3 < Re(s) < 2$

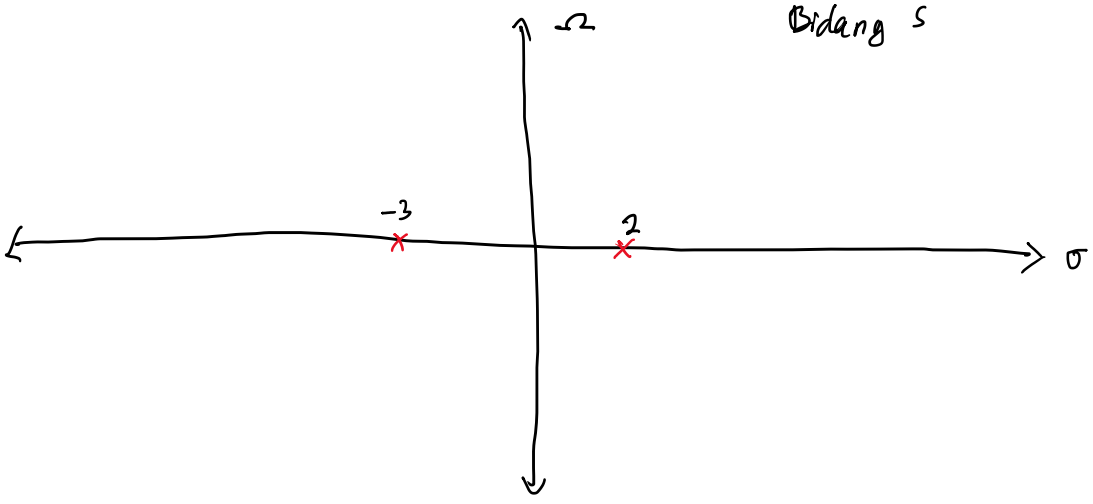
c. Pole :

⇒ $s + 3 = 0$ ⇒ $s - 2 = 0$

$s = -3$ $s = 2$

Zero :

⇒ Tidak ada zero



2. $$\frac{2s+4}{s^2+4s+3} = \frac{2s+4}{(s+1)(s+3)} = \frac{A}{s+1} + \frac{B}{s+3}$$

$$A(s+3) + B(s+1) = 2s + 4$$

$$As + 3A + Bs + B = 2s + 4$$

$$(A+B)s + 3A + B = 2s + 4$$

$$A + B = 2$$

$$3A + B = 4 \quad -$$

$$-2A = -2$$

$$A = 1$$

$$B = 1$$

$$\frac{2s+4}{s^2+4s+3} = \frac{1}{s+1} + \frac{1}{s+3}$$

b) Pole :

$s + 1 = 0$ $\qquad$ $s + 3 = 0$

$s = -1$ $\qquad$ $s = -3$

a. $Re(s) > -1 \longrightarrow Re_1(s) > -1$

$Re_2(s) > -3$

$$X_1(s) = \frac{1}{s+1} \longleftrightarrow x_1(t) = e^{-t}u(t)$$

$$X_2(s) = \frac{1}{s+3} \longleftrightarrow x_2(t) = e^{-3t}u(t)$$

$$X(s) = X_1(s) + X_2(s)$$

$$x(t) = x_1(t) + x_2(t)$$

$$x(t) = e^{-t}u(t) + e^{-3t}u(t)$$

b. $Re(s) < -3 \longrightarrow Re_1(s) < -1$

$Re_2(s) < -3$

$$X_1(s) = \frac{1}{s+1} \longleftrightarrow x_1(t) = -e^{-t}u(-t)$$

$$X_2(s) = \frac{1}{s+3} \longleftrightarrow x_2(t) = -e^{-3t}u(-t)$$

$$X(s) = X_1(s) + X_2(s)$$

$$x(t) = x_1(t) + x_2(t)$$

$$x(t) = -e^{-t}u(-t) - e^{-3t}u(-t)$$

c. $-3 < Re(s) < -1 \longrightarrow Re_1(s) < -1$

$Re_2(s) > -3$

$$X_1(s) = \frac{1}{s+1} \longleftrightarrow x_1(t) = -e^{-t}u(-t)$$

$$X_2(s) = \frac{1}{s+3} \longleftrightarrow x_2(t) = e^{-3t}u(t)$$

$$X(s) = X_1(s) + X_2(s)$$

$$x(t) = x_1(t) + x_2(t)$$

$$= -e^{-t}u(-t) + e^{-3}u(t)$$