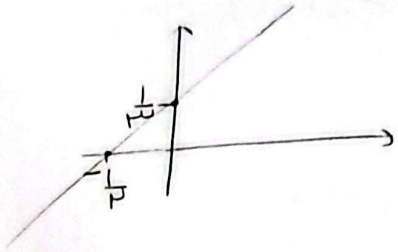


۱- فیضانی سید سید ۹۵۵۲
 $2y = 3x - 1 \rightarrow 3x = 2y + 1 \rightarrow x = \frac{2}{3}y + \frac{1}{3} \rightarrow f^{-1}(x) = \frac{2}{3}x + \frac{1}{3}$



$$\frac{1}{2} \times \frac{1}{3} \times \frac{1}{3} = \frac{1}{18}$$

۲-
 الف $x^2 = 2x + 3 \rightarrow$ یاب

$$y = (x-1)^2 + 2 \rightarrow (x-1)^2 = y-2 \rightarrow x-1 = \pm \sqrt{y-2} \xrightarrow{x \geq 1} x = \sqrt{y-2} + 1$$

$$\rightarrow f^{-1}(x) = \sqrt{x-2} + 1 \quad Df^{-1}(x) = Rf = [2, +\infty)$$

ب) $x^2 = 2x + 3$ یاب

$$\rightarrow x-1 = \pm \sqrt{y-2} \xrightarrow{x \geq 2} x = +\sqrt{x-2} + 1 \rightarrow Df^{-1} = Rf = [4, +\infty)$$

$$f(x) = 2x - \sqrt{4(x-1)(x-3)} = 2x - 2|x-2|$$

۳-

$$2x - 2(x-2) = 2x - 2x + 4 = 4 \rightarrow \text{یاب}$$

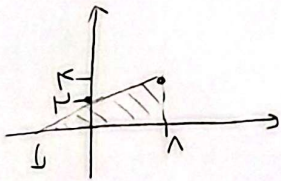
$$2x - 4 + 2x = 4x - 4$$

$$x \leq 2 \rightarrow 4x - 4 \leq 4$$

$$y = 4x - 4 \rightarrow 4x = y + 4 \rightarrow x = \frac{y}{4} + 1$$

$$\rightarrow f^{-1}(x) = \frac{x}{4} + 1$$

$$Df^{-1} = Rf = (-\infty, 4]$$



$$S = \frac{1}{2} \times 4 \times 2 = 4$$

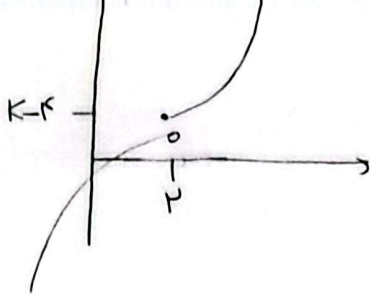
$$\frac{x}{2} + 2 = 0 \rightarrow x = -4$$

۴-
 $\frac{x_1}{\sqrt{x_1^2 - \omega}} = \frac{x_2}{\sqrt{x_2^2 - \omega}} \rightarrow \frac{x_1^2}{x_1^2 - \omega} = \frac{x_2^2}{x_2^2 - \omega} \rightarrow x_1^2 x_2^2 - \omega x_1^2 = x_1^2 x_2^2 - \omega x_2^2 \rightarrow \omega x_1^2 = \omega x_2^2 \rightarrow x_1^2 = x_2^2 \rightarrow x = \pm x_2$

چون صفر هوارو مثبت است و $x_1 = x_2$ پس $x_1 = x_2$

$$\frac{x}{\sqrt{x^2 - \omega}} = y \rightarrow y^2 = \frac{x^2}{x^2 - \omega} \rightarrow y^2 x^2 - \omega y^2 = x^2 \rightarrow x^2(1 - y^2) = -\omega y^2$$

$$\rightarrow x^2 = \frac{\omega y^2}{y^2 - 1} \rightarrow x = \sqrt{\frac{\omega y^2}{y^2 - 1}}$$



$$K - \lambda + K = K - f$$

$$-f + 1\mu + \mu K = \mu K + \lambda$$

$$\mu K + \lambda \leq K - f \rightarrow \mu K \leq -1\mu \rightarrow K \leq -4$$

-3

-4

$$\begin{array}{c|c|c} \mu\lambda & 0 & K\lambda \\ \hline f^{-1}(\lambda) = \frac{1}{\mu}\lambda & & f^{-1}(\lambda) = \frac{1}{K}\lambda \end{array}$$

$$\lambda(a-b) \circ \lambda(a+b)$$

$$\begin{array}{l} a+b = \frac{1}{K} \\ a-b = \frac{1}{\mu} \end{array} \rightarrow \begin{array}{l} \mu a = \frac{\mu}{K} \\ b = \frac{1}{\lambda} \end{array} \quad \left(\begin{array}{l} a = \frac{\mu}{K} \\ b = \frac{1}{\lambda} \end{array} \right)$$

$$\rightarrow ab = \frac{\mu}{4K}$$

-5

$$-10 = \frac{4+f}{\mu+m} \rightarrow m = -\mu$$

$$f(\lambda) = \frac{\mu\lambda + K}{\lambda - \mu} \rightarrow a+d=0 \rightarrow f^{-1}(\lambda) = f(\lambda)$$

$$f^{-1}(\lambda) = \frac{\mu\lambda + K}{\lambda - \mu} \quad f(f^{-1}(\lambda)) = f\left(\frac{\mu\lambda + K}{\lambda - \mu}\right) = \frac{\frac{9\lambda + 1\mu}{\lambda - \mu} + K}{\frac{\mu\lambda + K}{\lambda - \mu} - \mu}$$

$$= \frac{\frac{9\lambda + 1\mu + K\lambda - 1\mu}{\lambda - \mu}}{\frac{\mu\lambda + K - \mu\lambda + 9}{\lambda - \mu}} = \frac{1\mu\lambda}{1\mu} = \lambda$$

$$\rightarrow \lambda + \frac{\mu\lambda + K}{\lambda - \mu} = \lambda \rightarrow \lambda = \frac{K}{\mu}$$

$$g(\mu) = K \quad f(\mu) = -\mu$$

$$f(\mu - \mu\lambda) = -\mu \rightarrow \mu - g\left(\frac{\lambda}{\mu}\right) = -\mu \rightarrow g\left(\frac{\lambda}{\mu}\right) = K \rightarrow g^{-1}(K) = \frac{\lambda}{\mu}$$

$$\mu - \mu\lambda = n \rightarrow \lambda = \frac{\mu - n}{\mu} \rightarrow \mu\lambda = \mu - n \rightarrow n = \mu - \mu\lambda$$

$$K \times m + n = \mu\lambda + \mu - \mu\lambda = \mu$$

-6

$$y = \frac{\omega\lambda - 1\mu}{1 - \lambda} \rightarrow \frac{y-1}{y+1} = \frac{\omega\lambda - 1\mu}{\omega\lambda + 1\mu}$$

$$y = \frac{\omega\lambda - 1\mu}{1 + \lambda} \rightarrow -y = \frac{\omega\lambda + 1\mu}{\lambda + 1}$$

$$y = \frac{\omega(\lambda - \mu) + 1\mu}{\lambda - 1} = \frac{\omega\lambda + \mu}{\lambda - 1} \rightarrow \frac{\omega\lambda + \mu}{\lambda - 1} - \mu = \frac{\omega\lambda + \mu - \mu\lambda + \mu}{\lambda - 1}$$

$$= \frac{\mu\lambda + 4}{\lambda - 1} = f(\lambda) \rightarrow y\lambda - y = \mu\lambda + 4 \rightarrow \lambda(\mu - y) = -y - 4 \rightarrow \lambda = \frac{-y-4}{\mu-y}$$

$$\rightarrow f^{-1}(\lambda) = \frac{\lambda + 4}{\lambda - \mu}$$

$$\frac{\lambda + 4}{\lambda - \mu} = \frac{\mu\lambda + 4}{\lambda - 1} \rightarrow \mu\lambda^2 - \mu\lambda + 4\lambda - 1\mu = \lambda^2 + 4\lambda - 4$$

$$\rightarrow \lambda^2 - \mu\lambda - 4 = 0 \rightarrow \alpha + \beta = -\frac{b}{a} = \mu$$

-9

$$y = x + \kappa[x] \rightarrow [y] = [x + \underbrace{\kappa[x]}_{\varepsilon_2}] \rightarrow [y] = [x] + \kappa[x] \quad \text{— 10}$$

$$[y] = \omega[x] \rightarrow [x] = \frac{1}{\omega}[y] \rightarrow \frac{y-x}{\kappa} = \frac{1}{\omega}[y] \rightarrow y-x = \frac{\kappa}{\omega}[y]$$

$$x = y - \frac{\kappa}{\omega}[y] \rightarrow y = x + \frac{\kappa}{\omega}[x] \quad f(x) - g(x) = x + \kappa[x] - x + \frac{\kappa}{\omega}[x] \\ \rightarrow f(x) - g(x) = \frac{\kappa}{\omega}[x]$$