

$$f(x) \rightarrow \text{دایره} \rightarrow D_{f(x)} = [-2, 4]$$

$$\text{دایره } f\left(\frac{x+2}{\omega}\right) \rightarrow -2 \leq \frac{x+2}{\omega} \leq 4 \rightarrow -10 \leq x+2 \leq 20$$

$$\rightarrow -12 \leq x \leq 18 \rightarrow -4 \leq x \leq 4 \rightarrow [-4, 4]$$

(۲) -۱

$$f(x-2) \rightarrow D = [-2, 4] \rightarrow f(x) \rightarrow D = [-4, 6]$$

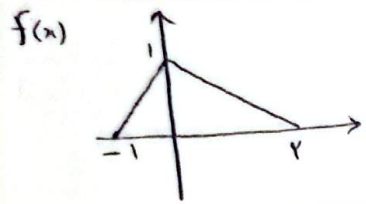
$$-2 \leq x \leq 4 \rightarrow -4 \leq x-2 \leq 6 \rightarrow -12 \leq x-2 \leq 20 \rightarrow -10 \leq x \leq 22$$

(۲) -۲

$$f\left(\frac{x+1}{\omega}\right) \rightarrow D = [-2, 4] \rightarrow f(x) \rightarrow D = [-4, 6] \rightarrow \left(\frac{-3}{\omega}, \frac{4}{\omega}\right)$$

$$-2 \leq x \leq 4 \rightarrow -4 \leq x+1 \leq 6 \rightarrow -12 \leq x+1 \leq 20 \rightarrow -10 \leq x \leq 22$$

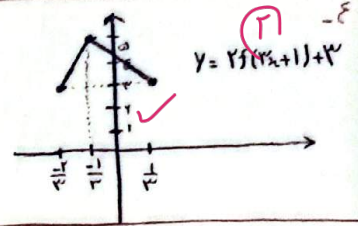
(۲) -۳



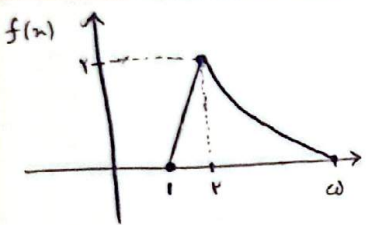
دایره $\rightarrow -1 \leq x+1 \leq 2 \rightarrow -2 \leq x \leq 1 \rightarrow \frac{-2}{\omega} \leq x \leq \frac{1}{\omega}$

① $y = 2f(x+1) + 3$ $[0, 2]$ کا دو برابر شود
 ② $y = 2f(x+1) + 3$ $[2, 4]$ کا سه واحد بالا می رود
 ③ نسبت بالا در تمام x

$x+1=0 \rightarrow x = -1$



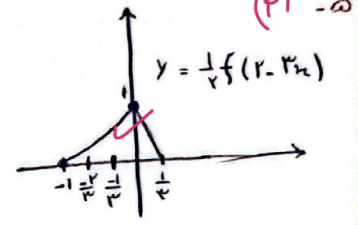
(۲) -۴



① دایره $1 \leq x-1 \leq \omega \rightarrow 2 \leq x \leq \omega+1 \rightarrow 1 \leq x \leq \omega$

$\rightarrow -1 \leq x \leq \frac{1}{\omega}$ ② $y = 2f(x-1) + 3$ $\rightarrow x = 0$

③ $R = [0, 1]$ می شود پس $\frac{1}{\omega}$ می شود



(۲) -۵

$y = \frac{1}{\omega}x + \frac{1}{\omega}x + 1$ $x_5 = \frac{-b}{\omega a} = \frac{-\frac{1}{\omega}}{\frac{1}{\omega}} = -1$ $y_5 = \frac{-9}{\omega} + \frac{1}{\omega} + 1 = \frac{-8}{\omega} + 1 = \frac{-8 + \omega}{\omega}$

$y = \frac{1}{\omega}(x^2 - \frac{1}{\omega}x - 1) = \frac{1}{\omega}(x^2 - \frac{1}{\omega}x + \frac{1}{4\omega^2} - \frac{1}{4\omega^2} - 1) = \frac{1}{\omega}(x - \frac{1}{2\omega})^2 - \frac{1}{4\omega^2} - 1$ $\rightarrow y' = \frac{1}{\omega}(2x - \frac{1}{\omega}) = 0 \rightarrow x = \frac{1}{2\omega}$

$\rightarrow y' = \frac{1}{\omega}(x^2 - 1x + 1) + 3 \rightarrow y' = \frac{1}{\omega}x^2 + \frac{1}{\omega}x - \frac{1}{\omega} + 3 = \frac{1}{\omega}x^2 + \frac{1}{\omega}x - \frac{1}{\omega} + 3$ $\rightarrow x, \text{ دایره}$

$\frac{1}{\omega}x^2 + \frac{1}{\omega}x - \frac{1}{\omega} + 3 = 0 \rightarrow x^2 - 1x + 1 = 0 \rightarrow (x-1)(x-1) = 0 \rightarrow x = 1$

(۲) -۶

$f(x) = y$ $(1, 4)$ $y = 1-2f(x+2) \rightarrow (\alpha, \beta)$

$\rightarrow x_5 = 1 \Rightarrow x+2=1 \Rightarrow x = -1 \Rightarrow x' = \alpha = \frac{-1}{\omega}$

$\rightarrow y_5 = 4 \Rightarrow -2(4)+1 \Rightarrow y' = \beta = -7$

$\alpha \beta = \frac{-1}{\omega} \cdot -7 = \frac{7}{\omega}$

(۲) -۷

$D_f = (a, 4] \rightarrow D_{f(x-1)} = [a+1, 4]$ $D_g = [-1, b) \rightarrow D_{g(x+1)} = [-2, b-1)$

$(a+1, 4] \cap [-2, b-1) \rightarrow (-2, 4) = (a+1, b-1) \Rightarrow a+1 = -2 \Rightarrow a = -3$ $b-1 = 4 \Rightarrow b = 5$

$a-b = -3-5 = -8$

(۲) -۸

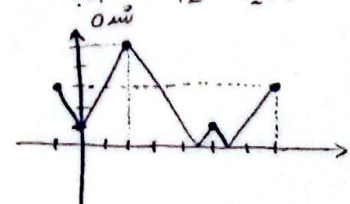
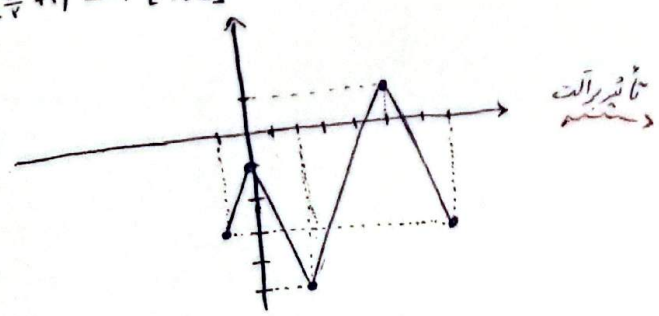
$f\left(\frac{x}{\omega}+1\right) \rightarrow [-2, 4] \rightarrow -2 \leq \frac{x}{\omega}+1 \leq 4 \rightarrow \frac{-2}{\omega} \leq \frac{x}{\omega} \leq \frac{3}{\omega}$

$2f(x)-3 \rightarrow y$ $\rightarrow y = 2f(x)-3$

$R = [0, 5]$

$D = [\frac{1}{\omega}, \frac{3}{\omega}]$

(۲) -۹



$$f(x) = \left| \frac{x+1}{x+1} \right| \rightsquigarrow \text{Cuvb } \frac{x+1}{x+1} \Rightarrow g(x) = \left| \frac{(x-1)+1}{1(x-1)+1} \right| + 1 = \left| \frac{x-1}{x-1} \right| + 1$$

$$\rightsquigarrow x+1 + \underbrace{\left| \frac{x-1}{x-1} \right|}_{[0, +\infty)} < 0 \rightsquigarrow \left| \frac{x-1}{x-1} \right| < -x-1 \Rightarrow \textcircled{1} -x-1 > 0 \Rightarrow x < -1$$

$$\textcircled{1} \frac{x-1}{x-1} < -x-1 \rightsquigarrow x-1 > (x-1)(x-1) \rightsquigarrow x-1 > -x^2 + 2x - 1$$

$$\rightsquigarrow x^2 > x \rightsquigarrow x > \sqrt{x}, \quad x < -\sqrt{x} *$$

$$* (-\infty, -\sqrt{x})$$