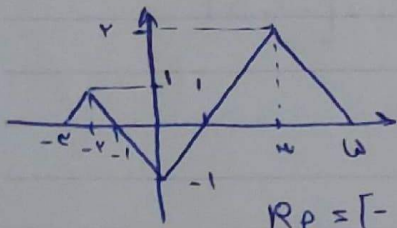


(۷)

$$(x, y) : (1, 4) \rightarrow \left(\frac{x-1}{3}, 1-y\right) : \left(\frac{1-y}{3}, 1-y(4)\right) = (-1/3, -3) \\ \rightarrow \alpha\beta = \sqrt{1/9}$$

(۸)

$$D_f \subseteq (a, 4] \rightarrow D_{f(m-1)} = (a+1, 4) \xrightarrow{n} (-2, 4) \\ D_g \subseteq [-1, b) \rightarrow D_{g(m+1)} = [-2, b-1) \quad \begin{array}{l} a+1 \leq -2 \rightarrow a \leq -3 \rightarrow a-b \leq -9 \\ b-1 \geq 4 \rightarrow b \geq 5 \end{array}$$



(۹)

$$D_{f(m+1)} = [-3, 4] : \begin{array}{l} 2m-2 \leq -2 \rightarrow m \leq -1/2 \\ 2m-2 \leq 4 \rightarrow m \leq 3 \end{array} \rightarrow D_f = [-1/2, 3/2]$$

$$R_f = [-1, 1] \rightarrow R_{2f(m)-2} = [-4, 1] \rightarrow |2f(m)-2| \subseteq [0, 4]$$

$R_{\sqrt{|2f(m)-2|}} = [0, \sqrt{4}]$. دانسته می باشد که $f(n)$ ، یک باره چون n می باشد.

(۱۰)

$$f(x) = \left| \frac{x+1}{x-1} \right| \xrightarrow{(1)} \left| \frac{x-2+1}{x(x-2)+1} \right| \xrightarrow{(2)} \left| \frac{x-1}{x-2} \right| + 1 = g(x)$$

$$x + g(x) < 0 \quad \begin{array}{l} \text{قد بر طبق} \\ x < 1 \end{array} \quad x + \frac{x-1}{x-2} + 1 \leq \frac{x^2 - 2x + x - 1 + x - 2}{x-2} \leq \frac{x^2 - x - 3}{x-2}$$

$$\begin{array}{c} -2 \quad 1 \quad 2 \\ - \quad + \quad - \quad + \\ \hline \end{array} \rightarrow (-\infty, -2) \quad \begin{array}{l} \text{قد بر طبق} \\ x > 2 \end{array} \rightarrow \begin{array}{c} -2 \quad 1 \quad 2 \\ - \quad + \quad - \quad + \\ \hline \end{array} \rightarrow \text{منفی نیست، جواب ندارد.}$$

$$\text{قد بر طبق} \rightarrow 1 < x < 2 \quad x + \frac{1-x}{x-2} + 1 = \frac{x^2 - 2x + 1 - x + x - 2}{x-2} \leq \frac{x^2 - 2x - 1}{x-2}$$

$$\begin{array}{c} 1-\sqrt{5} \quad 2 \quad 1+\sqrt{5} \\ - \quad + \quad - \quad + \\ \hline \end{array} \rightarrow 1 < x < 2 \rightarrow \text{منفی نیست، جواب ندارد.} \\ 1 \pm \sqrt{5} \leq \frac{x \pm \sqrt{x^2 - (2x-2)}}{x}$$

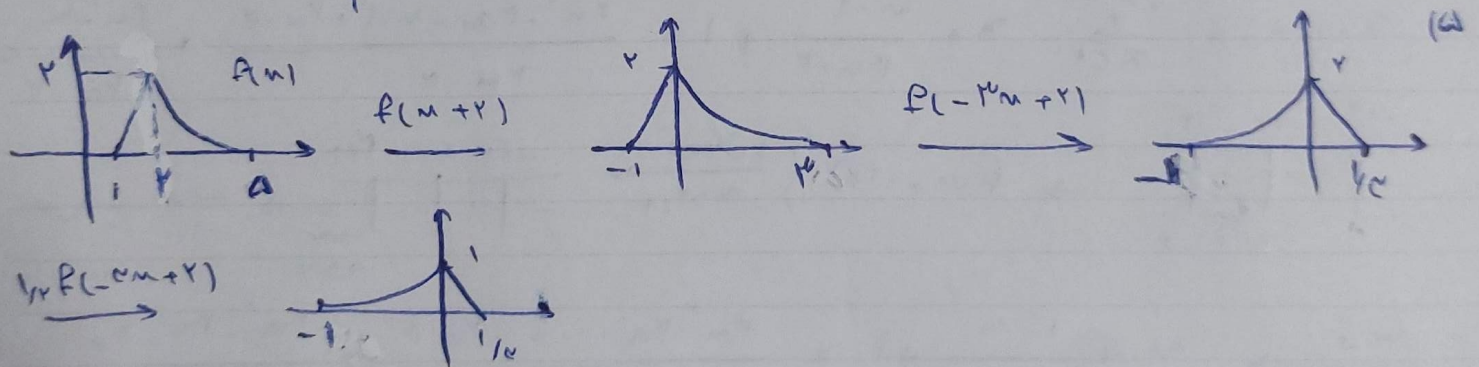
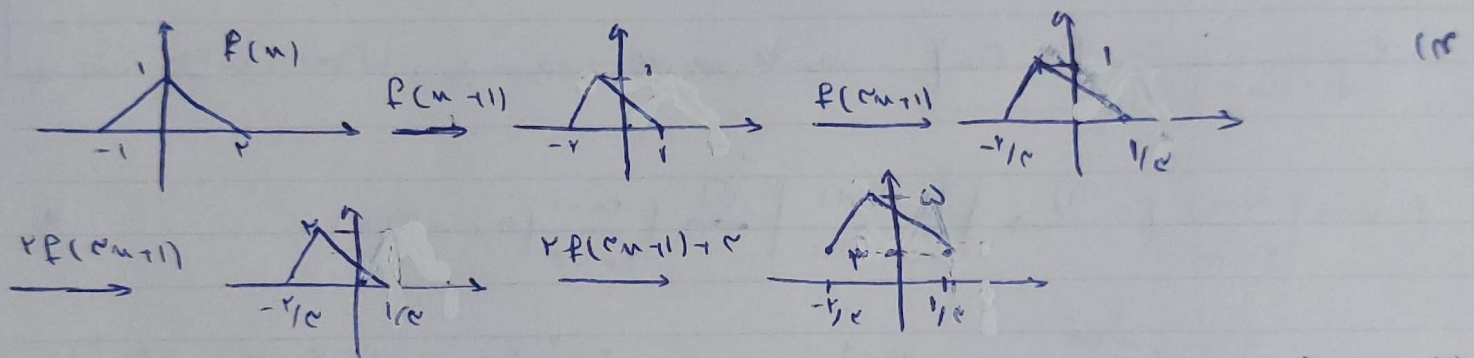
جواب نهایی : $(-\infty, -2)$

$$(x, y) \rightarrow [-r, r] \rightsquigarrow \left(\frac{\omega x - r}{r}, y\right) \rightarrow D_f: [-r, r] \quad (1)$$

$$\begin{aligned} \frac{x+r}{r} \rightarrow [-r, r] &\rightarrow x \rightarrow \frac{x+r}{r} \leq -r \rightarrow x \leq -r \\ &\hookrightarrow \frac{x+r}{r} \leq r \rightarrow x \leq r \end{aligned} \rightarrow [-r, r] \quad (2)$$

$$\begin{aligned} \frac{r x - 1}{r} \rightarrow [-1, r] &\rightarrow \frac{r x - 1}{r} \leq -1 \rightarrow x \leq -1 \\ &\hookrightarrow \frac{r x - 1}{r} = r \rightarrow x = \omega \end{aligned} \rightarrow D_f: [-1, \omega] \quad (3)$$

$$-\frac{x}{\omega} + \frac{r}{\omega} \rightarrow \left(-\frac{r}{\omega}, \frac{r}{\omega}\right)$$



$$\text{چون } f(x) = \frac{-b}{rx} \leq \frac{-r/\omega}{-r/\omega} = \frac{r}{\omega} \rightarrow y \leq \frac{r}{r\omega}$$

$$\Rightarrow f(x) = a(x - r/\omega)^r + \frac{r}{\omega} \rightarrow a \leq -1/r \rightarrow f(x) \leq -1/r(x - r/\omega)^r + \frac{r}{\omega}$$

$$f(x') \leq -1/r(x - r/\omega)^r + r \rightarrow y \leq f(x') \leq -1/r(x - r/\omega)^r + r = 0 - r$$

$$\begin{aligned} (x - r/\omega)^r \leq 0 &\rightarrow x \leq 1 \\ &\hookrightarrow x \leq r \end{aligned}$$