

الف) $[-f(x)] \xrightarrow{\text{تغییر } x} \xrightarrow{\text{تغییر } y} [-\frac{y}{2}, \frac{y}{2}]$ ✓

$f(x)$

$f(x) = \frac{1}{2}x \Rightarrow f(x) = \frac{1}{2}x$

$[f(x)] \Rightarrow [-1, 1]$ ✓

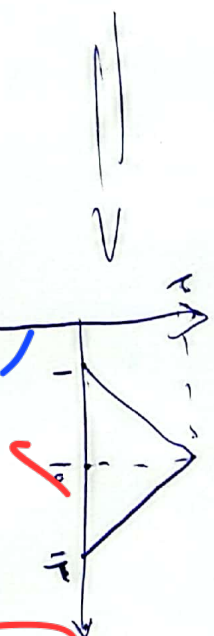
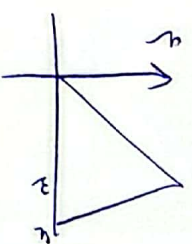
ب)

$(x-1) + \sqrt{x-1} = y \Rightarrow x-1 = y - \sqrt{x-1} \Rightarrow x = y + \sqrt{x-1}$ ①

$(x-1)^2 = y^2 \Rightarrow x-1 = y \Rightarrow x = y+1$

$\begin{cases} x = y-1+\sqrt{y-1} \\ x = y \end{cases} \Rightarrow y = y-1+\sqrt{y-1}$

$g(x) = f(x+1) \Rightarrow f(x) = g(x-1)$



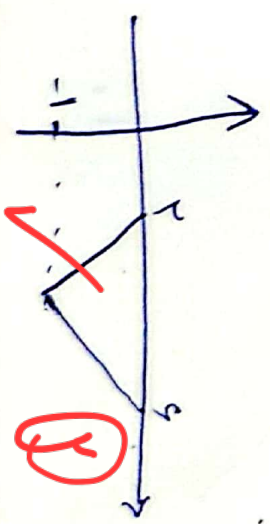
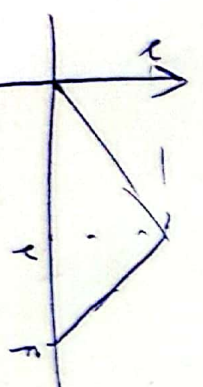
$\frac{1}{2}x = \frac{1}{2}$

$A(x, y) \xrightarrow{\text{تغییر } x} \xrightarrow{\text{تغییر } y} \xrightarrow{\text{تغییر } z} \left(\left(\frac{y}{2}, \frac{y}{2} \right) \right)$ ①

$x-1 = y \Rightarrow x = y+1$

$f\left(\frac{x-1}{2}\right) = \frac{y-1}{2} \Rightarrow \frac{x-1}{2} = y-1 \Rightarrow x = 2y-1$

$-f(x-1) \xrightarrow{\text{تغییر } x} \xrightarrow{\text{تغییر } y} \xrightarrow{\text{تغییر } z} f(x)$



$$\sqrt{-(x+1)(x-1)} \quad \begin{matrix} \text{برای } x < -1 \\ \text{برای } x > 1 \end{matrix}$$

$$\Rightarrow -\phi + \phi - \phi + \phi -$$

$$Dy \in [-x_0] \cup [1, x]$$

(B)

$$\frac{x+1}{x-1} > \frac{y-1}{y+1} \Rightarrow |yx + yx - y| - y \Rightarrow y_{max} = 5 \Rightarrow |yx - y| - y = |y| + 1 = 5$$

$$y = |yx - y| \Rightarrow yx - y = y \Rightarrow x = \frac{y}{y} = 1 \Rightarrow x = 1$$

(B)

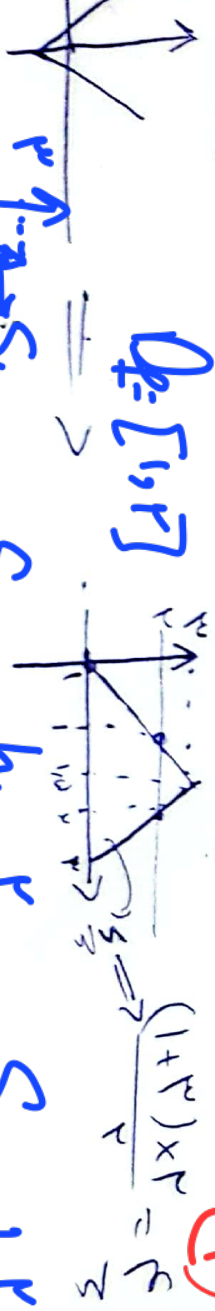
$$\frac{y-1}{x+1} + \frac{y+1}{x-1} = 2 \Rightarrow \frac{y-1}{x+1} + \frac{y+1}{x-1} = 2 \Rightarrow \frac{y^2-1}{x^2-1} = 2 \Rightarrow y^2-1 = 2(x^2-1) \Rightarrow y^2 = 2x^2-1$$

$$k - f = \frac{-1yx - 1}{x^2 + 1} = 0 \Rightarrow k = f$$

(B)

برای $x > 1$ و $y > 1$ داریم:

$$Q \in [1, 2]$$

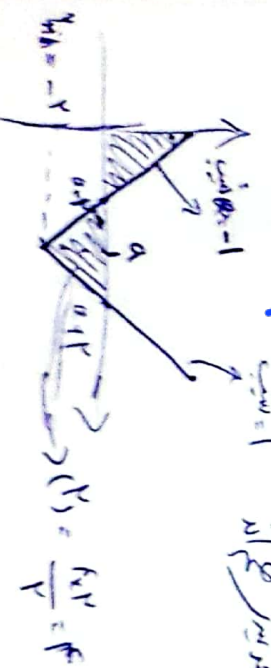


$$\frac{S_1}{S_2} = \left(\frac{h_1}{h_2}\right)^2 \rightarrow \frac{S_1}{S_2} = \left(\frac{1}{2}\right)^2$$

چون $h_1 = 1$ و $h_2 = 2$ داریم:

$$|x-a| - y \Rightarrow y_{min} = -y$$

$$(1) = \frac{a}{2} - f \Rightarrow \frac{1}{2} = S_{a,1} = \frac{(a-y)^2}{2} = \frac{1}{2}$$



$$f(x) = f\left(\frac{1}{x}\right) = \left|\frac{1}{x} - y\right| - y = 1 \Rightarrow \left|\frac{1}{x} - y\right| = 1 + y$$

$$\left(\frac{1}{x}\right)^2 = f\left(\frac{1}{x}\right) = f\left(\frac{1}{2}\right)$$

$$S_1 = \frac{1}{2}$$