

$$f(x): D_f = [-4, 2] \rightarrow g(x) = f(2x-2) \rightarrow D_g = \{x \mid 2x-2 \in [-4, 2]\} \quad (1)$$

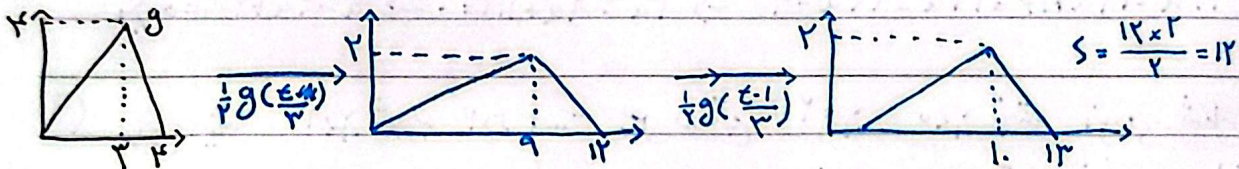
$$\rightarrow D_g = \left[-\frac{4}{2}, \frac{2}{2}\right]$$

$$f(2x-2) = g(x): D_g = [-2, 1] \rightarrow f(x): D_f = \{2x-2 \mid x \in [-2, 1]\} = [-4, 0]$$

$$y = x + \sqrt{x-2} \xrightarrow{\substack{\text{قرینه } x=y-2 \\ \text{و از آنجا که } y \geq 2}} y = x-2 + \sqrt{x-2} \xrightarrow{x=y-2} x = y-2 + \sqrt{y-2} \quad (2)$$

$$\left. \begin{array}{l} x = y-2 + \sqrt{y-2} \\ x = y \end{array} \right\} \Rightarrow y = \sqrt{y-2} \rightarrow x = y = 1$$

$$g(x) = 2f(2x+1) \rightarrow f(x) = \frac{g\left(\frac{x-1}{2}\right)}{2} \quad (3)$$

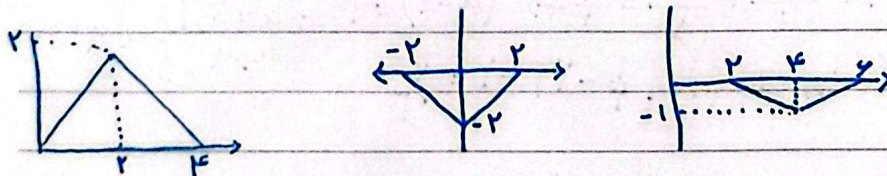


(4)

$$A|_{-2}^2: y = f(x) \rightarrow A': y = a + 2f\left(\frac{x-a}{2}\right) \rightarrow \frac{x-a}{2} = 2, y = a + 2f(2)$$

$$x = a+4, y = a-4 \rightarrow y = 2x-1: a-4 = 2a+1-1 \rightarrow a = -4$$

$$y = -f(x-2) \rightarrow y = f(x) \rightarrow \frac{1}{2} f(2-x) \quad (5)$$



$$y = \sqrt{-(x+2)f(2x-1)} \quad \text{نقطه } (0,0) \quad \begin{array}{c|ccc} x & -1 & 0 & 1 \\ \hline f(x) & - & + & - \end{array} \rightarrow \begin{array}{c|ccc} x & 0 & 1 & 2 \\ \hline f(2x-1) & - & + & - \end{array} \quad (6)$$

x	-2	0	1	2
$-x-2$	$+$	$-$	$-$	$-$
$f(2x-1)$	$-$	$-$	$+$	$-$
A	$-$	$+$	$-$	$+$

$\rightarrow x \in [-2, 0] \cup [1, 2]$

$$g(x) = f(x+k) - 3 \rightarrow g(x) = f(n) = f(n+k) - 3 \rightarrow f(0) = f(k) - 3 \quad (V)$$

$x=0: f, f(0)$

$$|-3| + 1 = |2k-3| + 1 \rightarrow \cancel{2k-3} + 1 = \cancel{2k-3} + 1 \rightarrow 2k-3 = 0 \rightarrow 2k = 3 \rightarrow k = \frac{3}{2}$$

$$\rightarrow |2k-3| = 0 \rightarrow k = \frac{3}{2}, \frac{3}{2}, k > 0 \rightarrow k = \frac{3}{2}$$

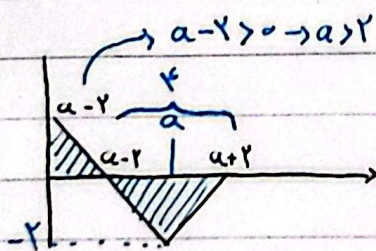
$$f(x) = \frac{2x-1}{x+1} \rightarrow -f\left(\frac{x}{a}\right) + a \rightarrow -\frac{2x-3}{x+3} + a = \frac{(a-2)x + 3a+3}{x+3} \quad (1)$$

$$\Rightarrow \frac{2x-1}{x+1} = \frac{(a-2)x + 3a+3}{x+3} \rightarrow 2x^2 + ax - 3 = (a-2)x^2 + (3a+1)x + 3a+3$$

$$(a-2)x^2 + (3a+1)x + 3a+3 = 0 \rightarrow \begin{cases} a-2=0 \rightarrow a=2 \\ \Delta=0 \rightarrow (3a+1)^2 - 4(a-2)(3a+3) = 0 \end{cases}$$

$$12a^2 - 32a + 16 = 12a^2 - 24a - 96 \rightarrow 4a^2 - 16a + 112 = 0 \rightarrow a^2 - 4a + 28 = 0$$

(9) برای اینکه x_2 و x_3 شبیه 2 باشد است پس در تابع $y_1 = 2-f$ باشد از روی شکل می توان دید مساحت مثلث برابر است و از آن جا که در y_1 نسبت به x_1 برابر انبساط طریقی یافته مساحت $\frac{1}{3}$ است



$$S = \frac{(a-2)^2}{2} \cdot \frac{4 \times 2}{2} = \frac{9}{2} \rightarrow (a-2)^2 = 1 \rightarrow a = 3, 1 \quad (1.)$$

$$f\left(\frac{1}{a}\right) = f\left(\frac{1}{3}\right) = \left| \frac{1}{3} - 3 \right| - 2 = \frac{8}{3}$$

$a > 2 \} a = 3$