

$$f(3x-2) \Rightarrow D_f = [-4, 5]$$

$$f(x) \Rightarrow D_f = \mathbb{R} \quad -4 \leq 3x-2 \leq 5 \Rightarrow -12 \leq 3x \leq 9 \Rightarrow -4 \leq x \leq 3 \Rightarrow D_f = [-4, 3]$$

ب

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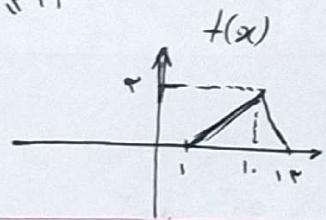
$$f(3x-2) \Rightarrow D_f = \mathbb{R} \quad -4 \leq 3x-2 \leq 5 \Rightarrow -12 \leq 3x \leq 9 \Rightarrow -4 \leq x \leq 3 \Rightarrow D_f = [-4, 3]$$

$$f(x) = x + \sqrt{x-2} \Rightarrow (x-2) + \sqrt{(x-2)-2} = x-2 + \sqrt{x-4} \Rightarrow \text{قرینۀ آن نسبت به } x \text{ برابر خودش است}$$

$$x-2 + \sqrt{x-4} = x \Rightarrow \sqrt{x-4} = 2 \Rightarrow x-4 = 4 \Rightarrow x = 8 \Rightarrow y = 8$$

$$f(3x+1) \Rightarrow D = [0, 4] \Rightarrow 0 \leq x \leq 4 \Rightarrow 1 \leq 3x+1 \leq 13$$

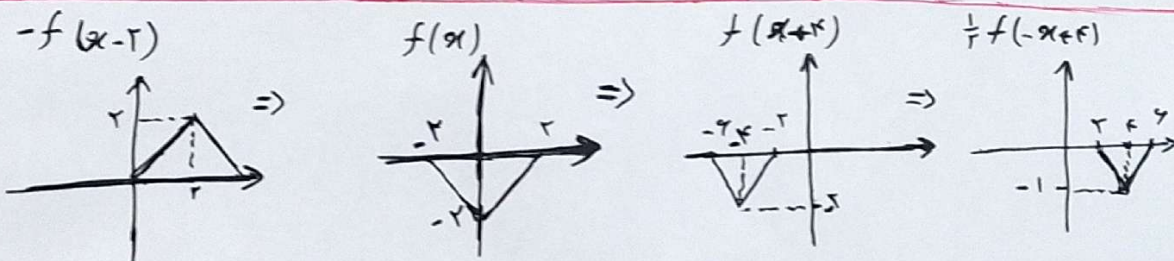
$$S = \frac{12 \times 2}{2} = 12$$



$$A(2, -2) \Rightarrow f(2) = -2 \quad A' \xrightarrow{x=2x-1} (x \in 2x-1)$$

$$A'(x, 2x-1) \Rightarrow y = a + 2f\left(\frac{x-a}{2}\right) = 2x-1 \Rightarrow f\left(\frac{x-a}{2}\right) = \frac{2x-1-a}{2}$$

$$\begin{cases} \frac{x-a}{2} = 2 \Rightarrow x-a = 4 \\ \frac{2x-1-a}{2} = -2 \Rightarrow 2x-a = -2 \end{cases} \Rightarrow \begin{cases} x-a = 4 \\ 2x-a = -2 \end{cases} \Rightarrow \begin{cases} x-a = 4 \\ -2x+2a = -12 \end{cases} \Rightarrow \begin{cases} x-a = 4 \\ -2x+2a = -12 \end{cases} \Rightarrow a = -4$$



$$\sqrt{-(x+2)} + f(3x+1) \Rightarrow -(x+2)f(3x+1) > 0 \Rightarrow (x+2)f(3x+1) < 0$$

$$f(x) \Rightarrow \text{Graph of } f(x) \text{ with roots at } -1, 2, 5$$

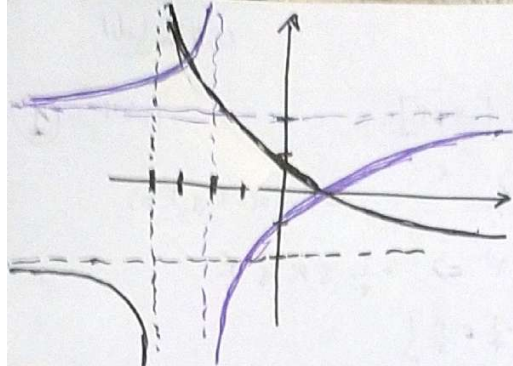
$$f(3x+1) \Rightarrow \text{Graph of } f(3x+1) \text{ with roots at } -2, 5, 14$$

$$D = [-2, 5] \cup [16, 2]$$

$$f(x) = |2x-3|+1 \Rightarrow |2(x+k)-3|+1-2 = |2x+2k-3|-2$$

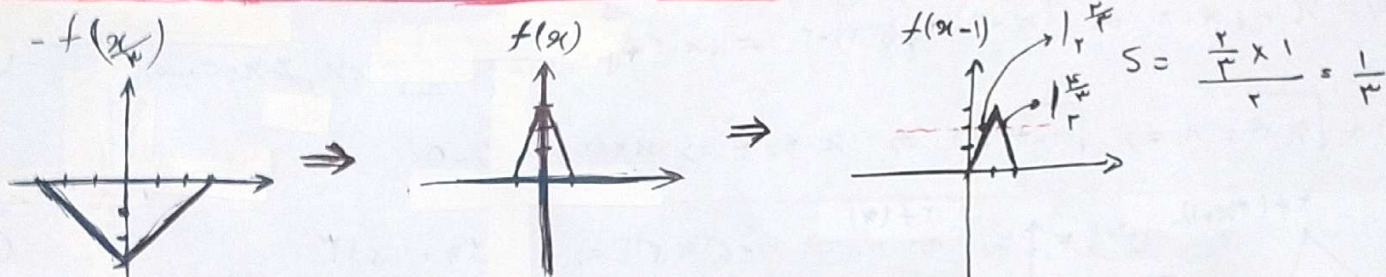
$$\Rightarrow x=0 \Rightarrow |2k-3|-2 = |-3|+1 = 4 \Rightarrow |2k-3| = 9 \Rightarrow 2k-3 = 9 \Rightarrow 2k = 12 \Rightarrow k = 6$$

$$\frac{2x-1}{x+1} \xrightarrow{\text{قرینۀ آن نسبت به } x} \frac{1-2x}{x+1} \xrightarrow{\text{طرح کردن 2 از صورت}} \frac{1-\frac{2x}{2}}{\frac{x}{2}+1} = \frac{2-2x}{x+2}$$



آن نمودار را f واحد بالاییم فقط $\Rightarrow$
در یک نقطه اشتراک دارند.

(9)



(10)

$$S_1 = \frac{(a-2)(a-2)}{2} = \frac{(a^2-4)}{2} = \frac{a^2-4a+4}{2}$$

$$S_2 = \frac{4 \times 2}{2} = 4$$

$$S_1 + S_2 = \frac{9}{2} \Rightarrow \frac{a^2-4a+4}{2} = \frac{9-4}{2} = \frac{1}{2} \Rightarrow$$

$$\Rightarrow a^2-4a+4=1 \Rightarrow (a-3)(a-1)=0 \Rightarrow \begin{cases} a=1 \text{ غلط} \\ a=3 \text{ قوی} \end{cases}$$

$$f(x) = |x-3|-2 \Rightarrow f\left(\frac{1}{3}\right) = \left|\frac{1}{3}-3\right|-2 = \left|-\frac{8}{3}\right|-2 = \frac{8-6}{3} = \frac{2}{3}$$