

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

$$-4 \leq 3x - 2 \leq 2$$

$$-2 \leq 3x \leq 4$$

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

ب) $f(3x-2) \quad D_{f(3x-2)} = [-4, -2]$

$$x = -4 \rightarrow 3\left(-\frac{4}{3}\right) - 2 = -14$$

$$x = -2 \rightarrow 3\left(-\frac{2}{3}\right) - 2 = -8$$

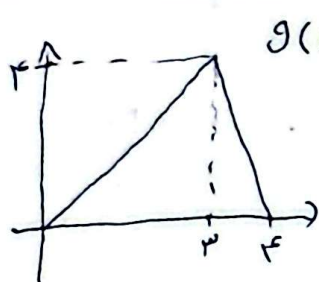
$$D_{f(x)} = [-14, -8]$$

$$x \rightarrow x-2$$

$$x + \sqrt{x-2} \rightarrow x-2 + \sqrt{x-2}$$

چون نسبت به خط $x=2$ نزدیک می‌شویم
و نقطه‌ای برخورد با نیساز ناحیه اول که
همان خط $x=2$ است را می‌خواهیم
آن به خود آن فرقی نمی‌کند و هر دو در یک نقطه
به این خط برخورد می‌کنند

$$x-2 + \sqrt{x-2} = x \rightarrow \sqrt{x-2} - 2 = 0 \rightarrow x = 8 \rightarrow y = 8$$



$$g(x) = 2f(3x+1)$$

$$y \rightarrow \frac{y}{2}$$

$$x \rightarrow \frac{x-1}{3}$$



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

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

$$y = 2y + a$$

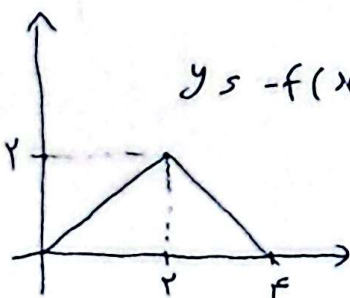
$$x = 2x + a$$

$$y = a + 2f\left(\frac{x-a}{2}\right)$$

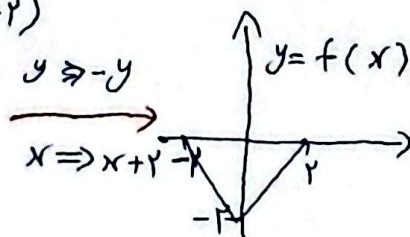
$$A' = (4+a, a-6)$$

$$y = 2x - 8 \rightarrow a - 6 = \frac{x+2a}{2} = -x$$

$$-6 = a$$

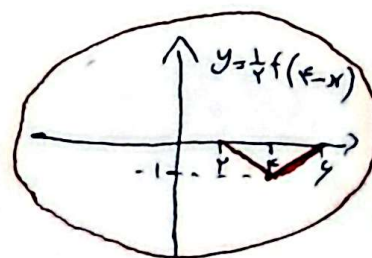


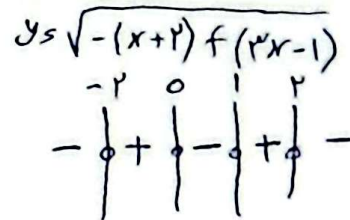
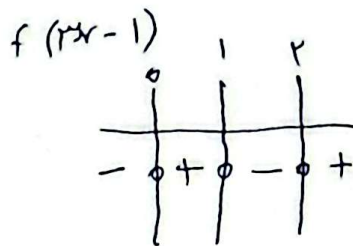
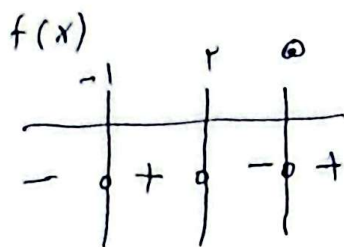
$$y = -f(x-2)$$



$$y \Rightarrow -y$$

$$x \Rightarrow x+2$$





$$D_y = [-2, 0] \cup [1, 2]$$

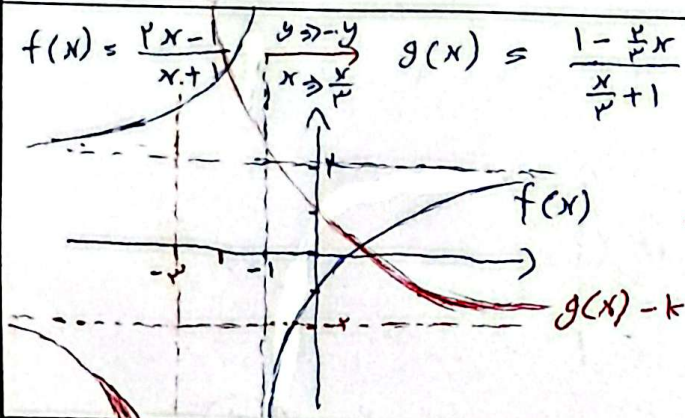
$$f(x) = |2x-3|+1 \xrightarrow[y=y-3]{x \rightarrow x+k} g(x) = |2(x+k)-3|+1-3$$

$$f(x) = g(x)$$

$$|2x-3|+1 = |2x+2k-3|-2 \xrightarrow{x=0} |-3|+1 = |2k-3|-2$$

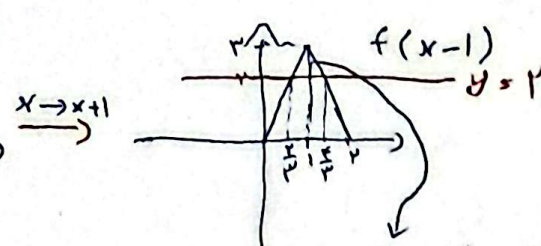
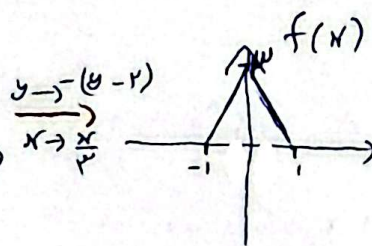
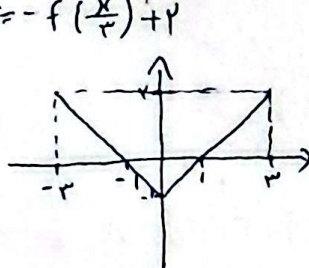
$$y = |2k-3| \rightarrow 2k-3 = y \rightarrow k = \frac{y+3}{2} \rightarrow k = 1.5 \text{ غلط } k > 0$$

$$f(x) = \frac{2x-1}{x+1} \xrightarrow[x \rightarrow \frac{x}{2}]{y \rightarrow -y} g(x) = \frac{1-\frac{x}{2}}{\frac{x}{2}+1} + k$$

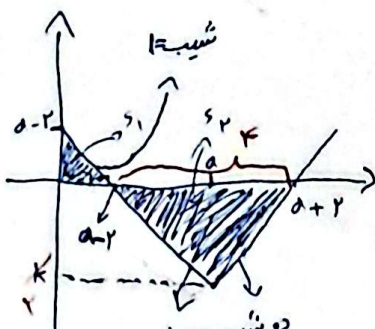


برای اینکه این دو نمودار در یک نقطه فقط هم را قطع کنند باید $g(x) = f(x)$ واحد به بالا انتقال داد $\rightarrow k = 4$

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



$$s = \frac{\frac{2}{3} \times 1}{2} = \frac{1}{3}$$



$$s_1 + s_2 = \frac{a}{2} \rightarrow \frac{f(x)^2}{2} = \frac{a}{2} \rightarrow s_1 = \frac{1}{2}$$

$$\frac{a^2 - 4a + 4}{2} = \frac{1}{2}$$

$$a^2 - 4a + 4 = 0 \rightarrow a = 2 \rightarrow \text{غلط}$$

$$f\left(\frac{1}{2}\right) = \left|\frac{1}{2} - 3\right| - 2 = \frac{7}{2}$$