

1
$$- \epsilon \leq 3x - 2 \leq \epsilon \rightarrow -2 \leq 3x \leq 2 + \epsilon \rightarrow -\frac{2}{3} \leq x \leq \frac{2 + \epsilon}{3} \rightarrow$$

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

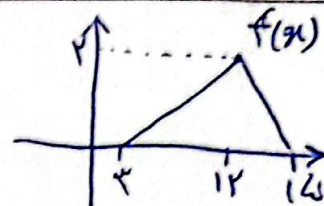
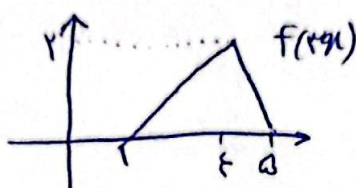
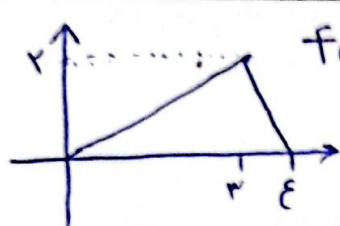
2
$$- \epsilon \leq x \leq -2 \rightarrow -12 \leq 3x \leq -6 \rightarrow -14 \leq 3x - 2 \leq -10$$

$$D_{f(x)} = [-14, -10]$$

3
$$f(x) = x - 2 + \sqrt{x - 4}$$

$$x = y - 4 + \sqrt{y - 4}$$

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



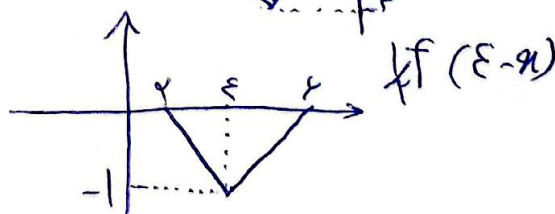
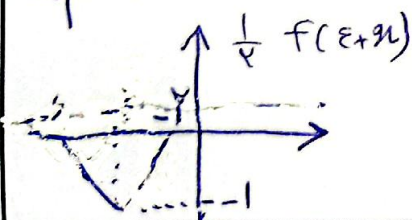
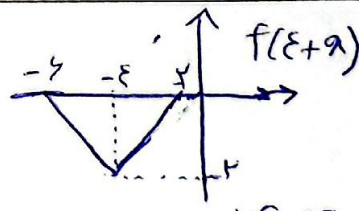
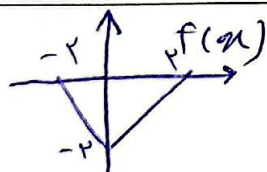
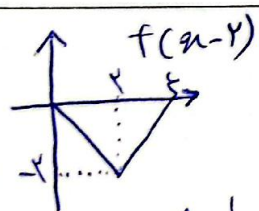
4
$$\frac{2x(15-3)}{2} = 12$$

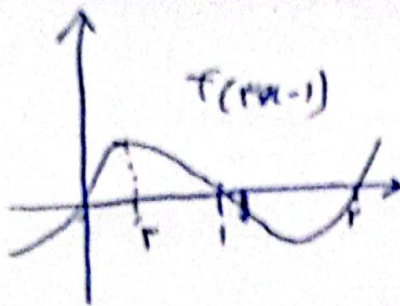
5
$$\frac{x-a}{2} = 2 \rightarrow x = 4 + a$$

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

6
$$f(2) = -3 \rightarrow a - 6 = y \Rightarrow y = 2x - 1 \rightarrow a - 6 = 2x - 1 \xrightarrow{x = 4 + a}$$

7
$$a - 6 = 2(4 + a) - 1 \rightarrow a = -6$$





$$-\frac{1}{2} - \frac{1}{2} + \frac{1}{2} - \frac{1}{2} + D_g = [-1, 0] \cup [0, 1]$$

$$-(x+1)f(x-1) \geq 0 \rightarrow (x+1)f(x-1) \leq 0$$

$$g(x) = |x(x+k) - 3| - 2 = |x^2 + kx - 3| - 2 \xrightarrow{\text{در } x=0} g(0) = | -3 | - 2 = 1$$

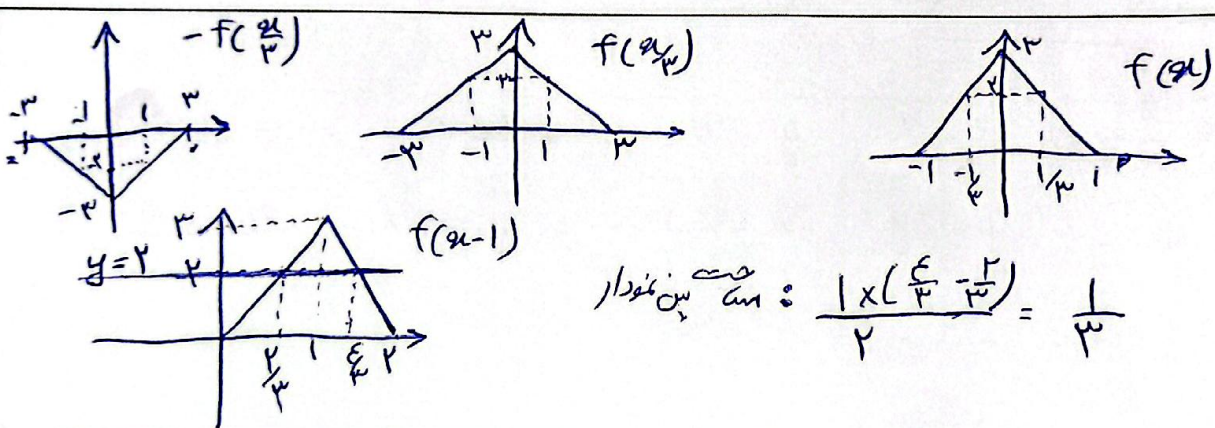
$$\frac{1}{2}k - 2 = 1 \rightarrow k = 6$$

$$\frac{1}{2}k - 2 = -1 \rightarrow k = 2$$

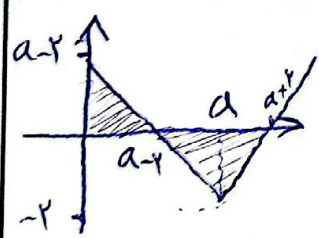
$$g(x) = \frac{1-x^2}{x+1} + k \quad f(x) = g(x) \rightarrow \frac{1-x^2}{x+1} = \frac{1-x^2}{x+1} + k \rightarrow k = \frac{(1-x^2)(x+1)}{(x+1)(x+1)} = \frac{1-x^2}{x+1}$$

$$\rightarrow \frac{1-x^2}{x+1} = k \rightarrow (1-k)x^2 + (k-1)x = 0 \rightarrow (1-k)x(x-1) = 0 \rightarrow 1-k=0 \rightarrow k=1$$

برای اینکه کجایه عدد باشد، مقدار باید در یک بازه باشد. در نتیجه:



$$\frac{1}{2} \times \left(\frac{1}{2} - \frac{1}{2} \right) = \frac{1}{2}$$



$$\frac{1}{2} = S_1 + S_2 = \frac{(a-1)^2}{2} + \frac{1}{2} \rightarrow a^2 - 2a + 1 = 1 \rightarrow a^2 - 2a = 0 \rightarrow a(a-2) = 0 \rightarrow a = 2$$

$$\frac{1}{2} + 1 + \frac{1}{2} - 1 = 1$$