

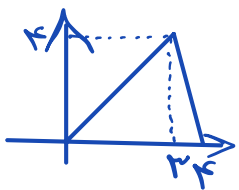
الف) $-4 \leq 3x-2 \leq 2 \rightarrow -2 \leq 3x \leq 4 \rightarrow -\frac{2}{3} \leq x \leq \frac{4}{3} \rightarrow D_{f(3x-2)} = [-\frac{2}{3}, \frac{4}{3}]$

ب) $-4 \leq 3x-2 \leq -2 \rightarrow -2 \leq 3x \leq 0 \rightarrow -\frac{2}{3} \leq x \leq 0 \rightarrow D_{f(x)} = [-\frac{2}{3}, 0]$

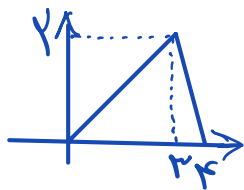
$y = x + \sqrt{x-2} \xrightarrow[\text{جواب}]{\text{قرینه کردن}} y = (x-2) + \sqrt{x-2} \xrightarrow{\text{قرینه کردن}} x = (y-2) + \sqrt{y-2}$

چون محل برخورد با نیم سازه اول روی خواص در نتیجه x دل با هم برابر هستند. $y = y-2 + \sqrt{y-2} \rightarrow 2 = \sqrt{y-2} \rightarrow y = 6$

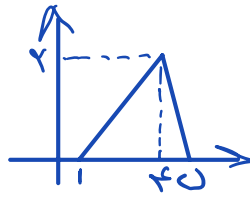
$2f(3x+1)$



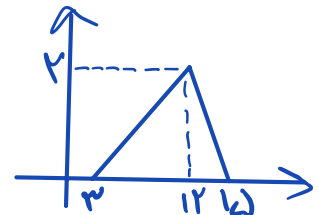
$f(3x+1)$



$f(3x)$



$f(x)$



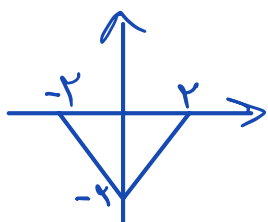
$S = \frac{12 \times 2}{2} = 12$

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

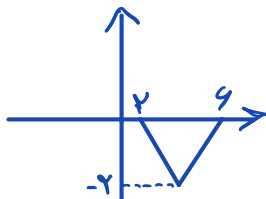
$y = a + 2(-2) = a-4$

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

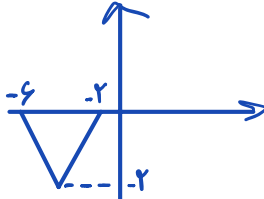
$f(x)$



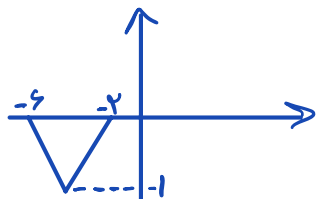
$f(x-2)$



$f(4-x)$



$\frac{1}{2}f(4-x)$



$$\begin{aligned}
 a < 3x-1 \rightarrow x < a &\rightarrow y = \sqrt{\quad} \rightarrow \text{جزر دامن نیست} \\
 2 \leq 3x-1 \leq 4 \rightarrow 1 \leq x \leq 2 &\rightarrow y = \sqrt{\quad} \rightarrow \text{جزر دامن است} \\
 1 < 3x-1 < 2 \rightarrow 0 < x < 1 &\rightarrow y = \sqrt{\quad} \rightarrow \text{جزر دامن نیست} \\
 -1 \leq 3x-1 \leq -1 \rightarrow -2 \leq x \leq 0 &\rightarrow y = \sqrt{\quad} \rightarrow \text{جزر دامن است}
 \end{aligned}$$

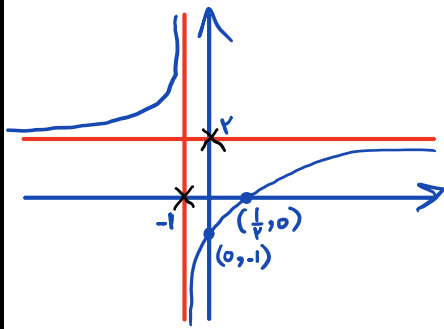
$$D = [-2, 0] \cup [1, 2]$$

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$$g(x) = |2(x+k)-3|-2 = |2x+2k-3|-2$$

$$g(0) = f(0) \rightarrow |2k-3|-2=4 \rightarrow |2k-3|=6 \xrightarrow{k>0} 2k=9 \rightarrow k=(\frac{9}{2}, 4)$$

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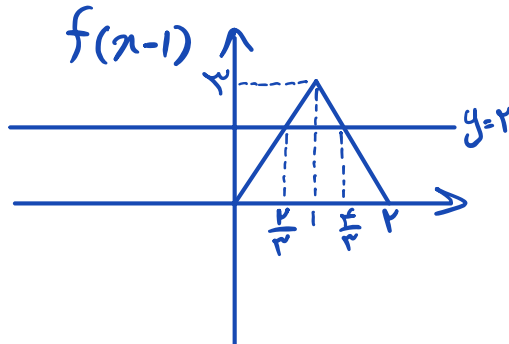
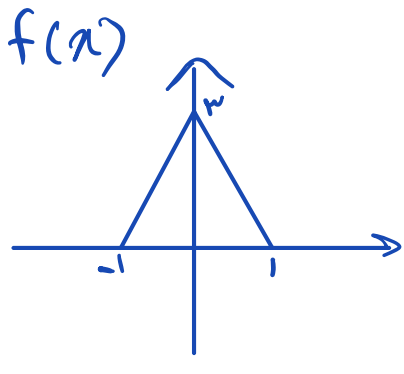


$$f(x) = \frac{2x-1}{x+1} \quad w_k = \frac{2x-1}{x+1} - \frac{3-2x}{x+3}$$

$$g(x) = \frac{1 - \frac{2x}{3}}{\frac{x}{3} + 1} + k$$

$$k = \frac{4x^2 + 5x - 6}{3x^2 + 12x + 9}$$

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$$S = \frac{\frac{2}{2} \times 1}{2} = \boxed{\frac{1}{2}}$$

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$$\frac{(a-2)(a-2)}{2} + \frac{4 \times (2)}{2} = \frac{9}{2} \rightarrow a^2 - 4a + 2 = 0 \rightarrow \begin{cases} a=2 \\ a=1 \end{cases}$$

$$f(\frac{1}{2}) = |\frac{1}{2} - 3| - 2 = \frac{5}{2} - 2 = \boxed{\frac{1}{2}}$$

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