

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

(الف)

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

$$D = [-2, 2] \rightarrow D_{f(x)} = ? \Rightarrow -2 \leq x \leq 2 \Rightarrow -12 \leq x \leq -4 \Rightarrow$$

$$-12 \leq x-2 \leq -4 \Rightarrow D_{f(x)} = [-14, -1]$$

$$y = x + \sqrt{x-2}$$

مثال ۱۰
نشان دهید که
تابع $y = x - 2 + \sqrt{x-2}$ را
با $x \rightarrow x-2$

$$\begin{aligned} \sqrt{x-2} = t &\Rightarrow x-2 = t^2 \Rightarrow x = t^2 + 2 \\ y &= t^2 + t + 2 = t^2 + t + \frac{1}{t} + \frac{1}{t} \Rightarrow \\ y &= \left(t + \frac{1}{t}\right)^2 + \frac{1}{t} \Rightarrow y - \frac{1}{t} = \left(t + \frac{1}{t}\right)^2 \Rightarrow \\ t + \frac{1}{t} &= \sqrt{y - \frac{1}{t}} \Rightarrow \sqrt{x-2} = \sqrt{y - \frac{1}{t}} - \frac{1}{t} \Rightarrow \end{aligned}$$

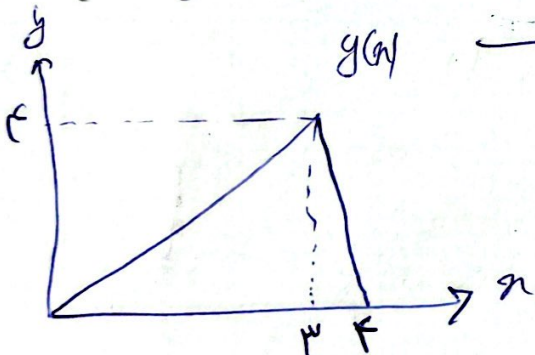
$$x = y - \frac{1}{t} + \frac{1}{t} - \sqrt{y - \frac{1}{t}} + 2 = y - \sqrt{y - \frac{1}{t}} + \frac{1}{t}$$

نشان دهید که

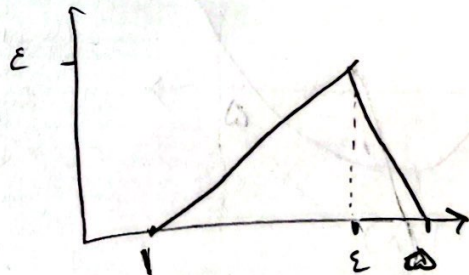
$$x - \sqrt{x - \frac{1}{t}} + \frac{1}{t} = x \Rightarrow \sqrt{x - \frac{1}{t}} = \frac{1}{t} \Rightarrow x - \frac{1}{t} = \frac{1}{t^2} \Rightarrow x = \frac{1+t^2}{t^2} = 1 + \frac{1}{t^2} \Rightarrow x = 1 \Rightarrow y = 1$$

نشان دهید که

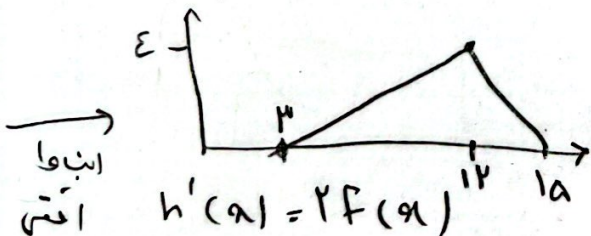
$$g(x) = 2f(x+1)$$



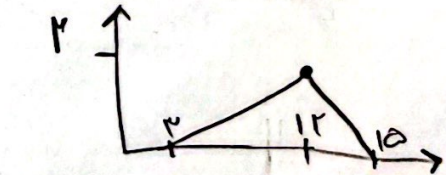
$$g(x) = 2f(x+1)$$



$$h(x) = 2f(x)$$



$$h'(x) = 2f(x)$$

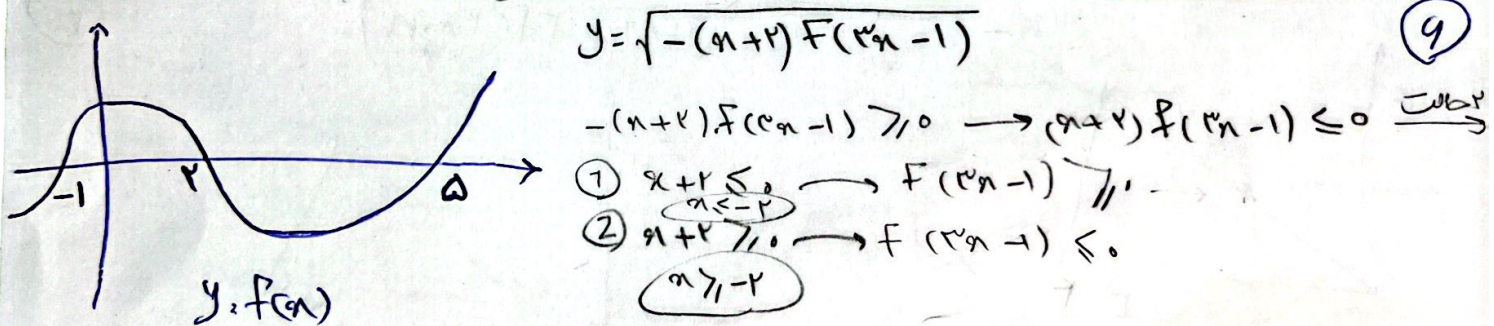
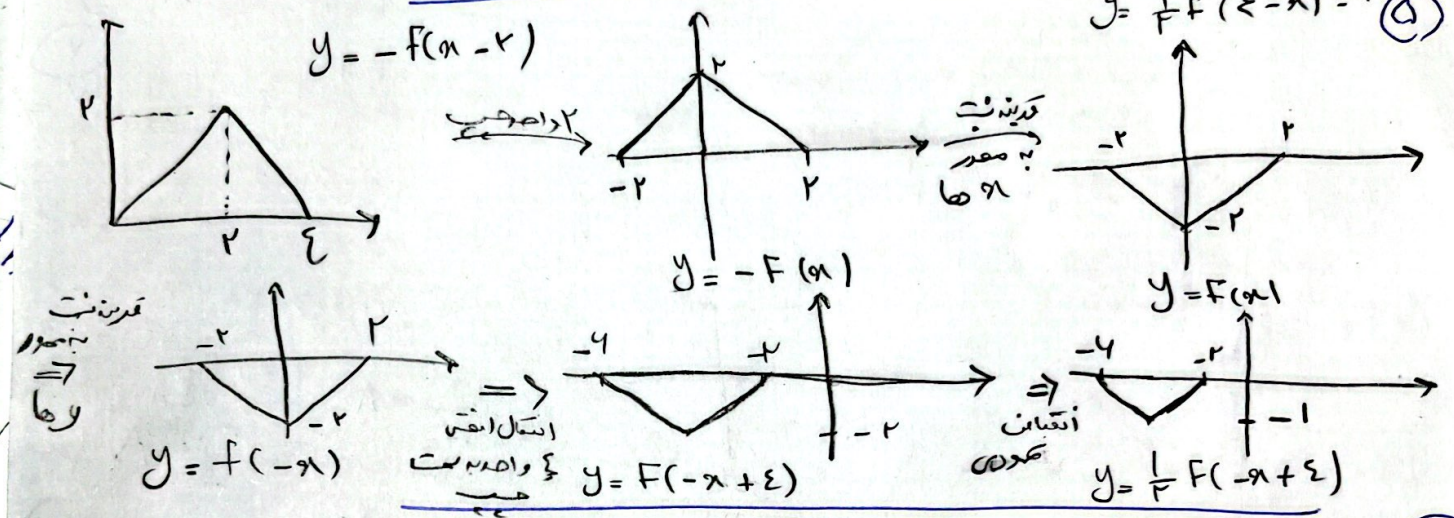


$$L(x) = f(x)$$

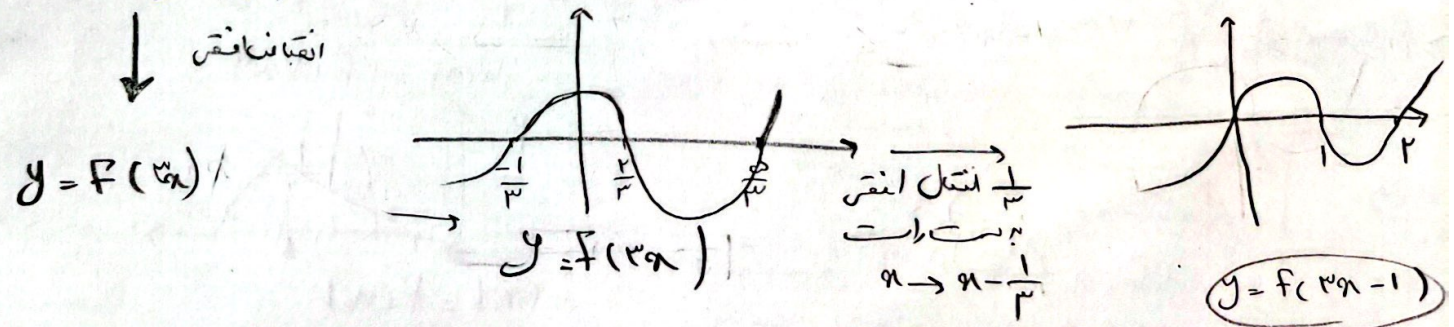
(F)

$A(2, -3) \rightarrow f(m) (x, y)$
 $A'(x', y') \rightarrow y = a + 2x \left(\frac{x-a}{2} \right)$
 $* f(2) = -3$
 $x' = 2x + a$
 $y' = 2y + a$
 $x=2 \rightarrow x' = 4+a$
 $y=-3 \rightarrow y' = -4+a$
 $A' (x', y') \rightarrow y' = 2x' - 1 \Rightarrow 2(4+a) - 1 = -4+a$
 $8+2a-1 = -4+a$
 $a = -4$

$y = -f(x-2)$
 $y = \frac{1}{f} F(x-2) = ?$ (A)



$y = \sqrt{-(x+2)F(3x-1)}$
 $-(x+2)F(3x-1) \geq 0 \rightarrow (x+2)F(3x-1) \leq 0$
 ① $x+2 \leq 0 \rightarrow F(3x-1) \geq 0$
 $x \leq -2$
 ② $x+2 > 0 \rightarrow F(3x-1) \leq 0$
 $x > -2$



حالت 1: $F(3x-1) \geq 0 \rightarrow x \geq 2 \leq x \leq 1$
 از طرفین $\rightarrow x \leq -2$
 حالت 2: $F(3x-1) \leq 0 \rightarrow x \leq 0 \leq x \leq 2$
 $x > -2$
 $\rightarrow [-2, 0] \cup [1, 2]$

$$y = |2x-3| + 1 \xrightarrow[\alpha \rightarrow \alpha+k]{\text{معمولاً } k} y = |2(\alpha+k)-3| + 1 = |2\alpha+2k-3| + 1 \quad (7)$$

انتقال
ساده و پایین

$$y'' = |2\alpha+2k-3| - 2 = y(\alpha)$$

برضوی F در $\alpha=0$ $\Rightarrow |2\alpha-3| + 1 = |2\alpha+2k-3| - 2 \xrightarrow{\alpha=0} \xi = |2k-3| - 2 \Rightarrow$
 $|2k-3| = 4 \xrightarrow{k>} \begin{cases} 2k-3=4 \\ 2k-3=-4 \end{cases} \Rightarrow 2k=9 \Rightarrow k = \frac{9}{2}$

درین معادله y (برضوی F) α و ξ صفر است

$$f(\alpha) = \frac{2\alpha-1}{\alpha+1} \xrightarrow[\text{مقلوب}]{\text{مشتق}} -\frac{2\alpha+1}{\alpha+1} \xrightarrow[\text{مقلوب}]{\text{مشتق}} \frac{-2\alpha+1}{\alpha+1} \xrightarrow[\alpha \neq 1]{\text{مشتق}} \frac{-2\alpha+3}{\alpha+1} \quad (8)$$

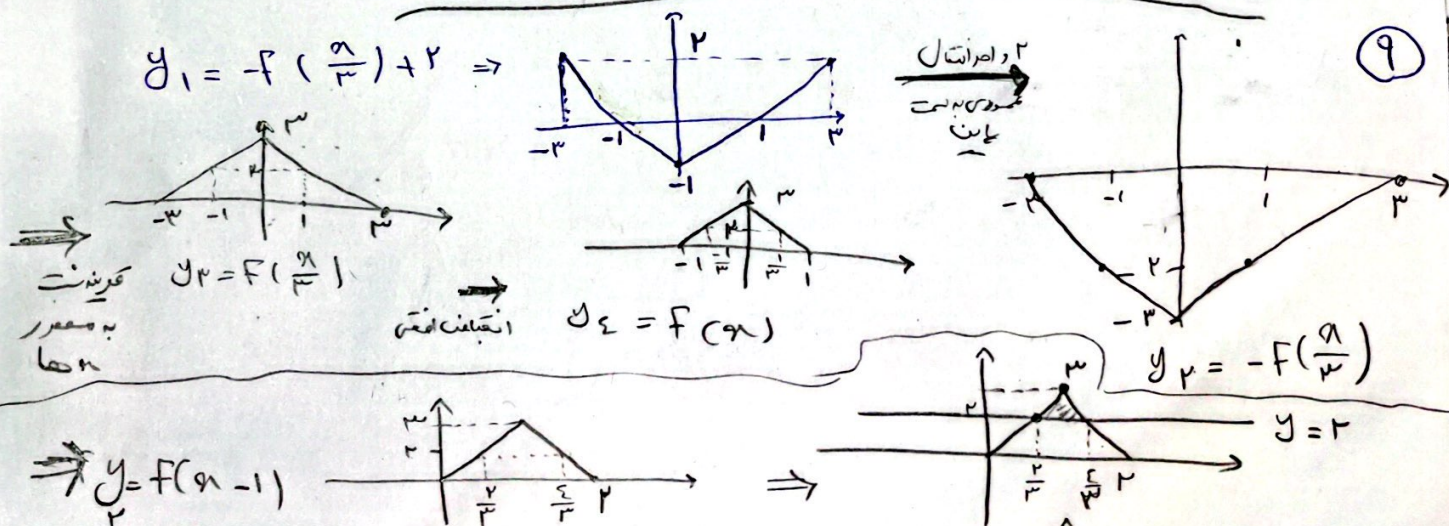
$$\xrightarrow[\text{مقلوب}]{\text{مشتق}} \frac{-2\alpha+3}{\alpha+1} + k = \frac{2\alpha-1}{\alpha+1} \Rightarrow \frac{2\alpha-1}{\alpha+1} + \frac{2\alpha-3}{\alpha+1} = k \Rightarrow \frac{(2\alpha-1)(\alpha+1) + (2\alpha-3)(\alpha+1)}{(\alpha+1)(\alpha+1)} = k$$

$$\Rightarrow \frac{2\alpha^2 + 2\alpha - \alpha - 1 + 2\alpha^2 - 3\alpha - 3}{\alpha^2 + 2\alpha + 1} = k \Rightarrow \frac{4\alpha^2 - 2\alpha - 4}{\alpha^2 + 2\alpha + 1} = k \Rightarrow$$

$$(4-k)\alpha^2 + (-2-2k)\alpha - 4 = 0 \xrightarrow[\text{صفرات}]{\Delta \text{ انتهای}} (4-k)^2 - 4(-2-2k)(-4) = 0 \Rightarrow$$

$$14 + 14k^2 - 32k + 8(4-k)(4+k) = 0 \Rightarrow 14k^2 - 18k + 11 = 0$$

چون k وجود ندارد



$$\Rightarrow y = f(\alpha-1)$$

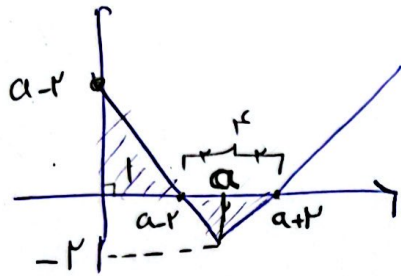
انتقال افقی $f(\alpha)$ و α را به سمت راست

حواسته سوال:

$$\Delta y = \left(\frac{2}{3} - \frac{2}{3}\right) \times 1 =$$

$$\frac{2}{3} = \frac{2}{3}$$

چون α را



$$f(x) = |x - a| - 2$$

$$a = 3 \rightarrow f\left(\frac{1}{3}\right) = f\left(\frac{1}{3}\right) \Rightarrow f\left(\frac{1}{3}\right) = \left|\frac{1}{3} - 3\right| - 2 = \frac{1}{3} - \frac{4}{3} = -\frac{3}{3} = -1$$

عَقَب
 حِجَاب

$$S_1 = \frac{(a-r)^2}{2}, \quad S_2 = \frac{2 \times \epsilon}{2} = \epsilon$$

$$S_{\text{total}} = \frac{9}{2} = \epsilon + S_1 \Rightarrow S_1 = \frac{1}{2} \Rightarrow$$

$$\frac{(a-r)^2}{2} = \frac{1}{2} \Rightarrow (a-r)^2 = 1 \rightarrow$$

$$\boxed{a-r = 1 \rightarrow a = 3}$$

$$a-r = -1 \rightarrow a = 1$$