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$$y = 3 - \sqrt{2x} \xrightarrow{\text{بجای } x} 3 - \sqrt{2(x+1)} = 3 - \sqrt{2x+2} \quad (2)$$

$$\frac{\text{قریبی}}{\text{و } x} \rightarrow -(3 - \sqrt{2x+2}) = \sqrt{2x+2} - 3 \xrightarrow{\text{با } 3 \text{ به } 0} \sqrt{2x+2} - 3 + 3$$

$$= \sqrt{2x+2} + 3$$

$$f(x) = \frac{1}{x} \rightarrow \sqrt{2x+2} + 3 = \frac{1}{x} \rightarrow \sqrt{2x+2} = \frac{1}{x} - 3 \rightarrow 2x+2 = \left(\frac{1}{x} - 3\right)^2$$

$$2x = \frac{1}{x} - 3 \rightarrow x = \frac{1}{1-3x} \quad \checkmark$$

$$Df \subset (a, \varepsilon] \text{ و } Dg \subset [-1, b) \text{ و } y = f(x-1) + g(x+1) \rightarrow x \in (-1, 0) \quad a-b?$$

$$\text{I } f(x-1) \Rightarrow a < x-1 < \varepsilon \rightarrow a+1 < x < \varepsilon+1 \rightarrow Df(x-1) \in (a+1, \varepsilon+1)$$

$$\text{II } g(x+1) \Rightarrow -1 < x+1 < b \rightarrow -2 < x < b-1 \rightarrow Dg(x+1) \in [-2, b-1)$$

$$\text{I} \cap \text{II} \Rightarrow (a+1, \varepsilon+1) \cap [-2, b-1) = (-2, \varepsilon+1) \rightarrow a+1 = -2 \rightarrow a = -3$$

$$\Rightarrow a-b = -3-1 = -4 \rightarrow ? \quad (2)$$

$$y = f\left(\frac{x}{2} + 1\right) \text{ و } D(y, \sqrt{|2f(x)-5|}) = ? \quad (2)$$

$$\frac{\text{داده } x}{\text{و } x} \rightarrow 2 \leq x \leq 5 \xrightarrow{x \leq \frac{1}{2}} -\frac{1}{2} \leq \frac{x}{2} \leq \frac{5}{2} \xrightarrow{x+1} -\frac{1}{2} \leq \frac{x}{2} + 1 \leq \frac{7}{2}$$

$$|2f(x)-5| \geq 0 \rightarrow \text{مقدار مثبت}$$

$$-1 \leq f(x) \leq 2 \xrightarrow{f(x) \geq 2} -2 \leq 2f(x) \leq 4 \xrightarrow{f(x) \leq 2} -5 \leq 2f(x)-5 \leq -1$$

$$\text{داده } x \rightarrow 0 \leq |2f(x)-5| \leq 5 \xrightarrow{\text{داده } x} 0 \leq \sqrt{|2f(x)-5|} \leq \sqrt{5}$$

$$Dy = \left[-\frac{1}{2}, \frac{7}{2}\right] \checkmark \text{ و } Ry = [0, \sqrt{5}] \checkmark \rightarrow 2$$

$$f(-\frac{1}{a}) = \frac{1}{f} \rightarrow -\frac{1}{a} r [-1] = \frac{1}{f} \rightarrow a^r = f \rightarrow \begin{cases} a = -r \checkmark \\ a = r \times \end{cases}$$

$$b=1 \quad b-a=r$$

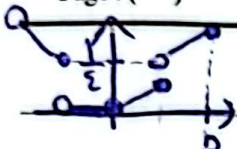
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$$\Rightarrow y = \frac{x}{a} [ax] \text{ و } b-a=2?$$

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(19)

$a < 0$

برای تعیین مقدار a ما $\frac{1}{a}$ تا $\frac{1}{a}$ باز می بینیم:

$$(\frac{1}{a}, 0] \in \mathbb{R} \rightarrow y=0 \quad / \quad [0, -\frac{1}{a}] \in \mathbb{R} \rightarrow y = -\frac{x}{a}$$

$$[-\frac{1}{a}, -\frac{2}{a}] \in \mathbb{R} \rightarrow -\frac{2x}{a} \xrightarrow{\text{جایگذاری}} x = -\frac{1}{a} \rightarrow y = -\frac{2(-\frac{1}{a})}{a} = \frac{2}{a^2}$$

$$\frac{2}{a^2} = \frac{1}{2} \rightarrow a^2 = 4 \rightarrow a = \pm 2 \quad \text{و} \quad b = -\frac{2}{a} = -\frac{2}{-2} = 1$$

$$\rightarrow b-a = 1 - (-2) = 3$$

$$f(x) = \log_r x \quad \text{و} \quad \log_r(x+r) - \log_r(x+r) \quad \text{قریبیت به} \quad \log_r(x+r)$$

$$-\log_r(x+r) + r \quad \text{قریبیت به} \quad -\log_r(x+r) + r$$

$$\rightarrow g(x) = -\log_r(x+r) + r \quad \rightarrow g(-1) = -\log_r 1 + r = -0 + r = r$$

$$g(-4r) = -\log_r \frac{4}{r} + r = -4 + r = r-4$$

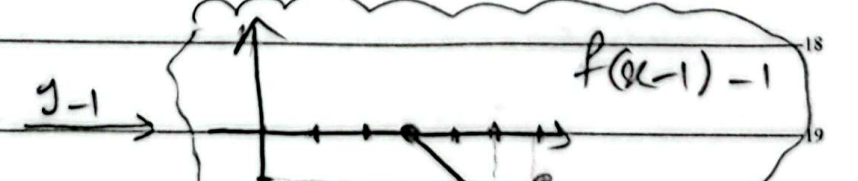
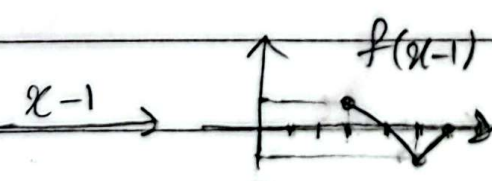
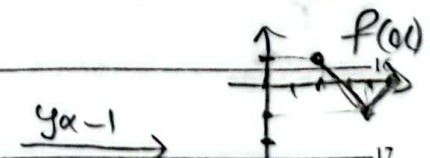
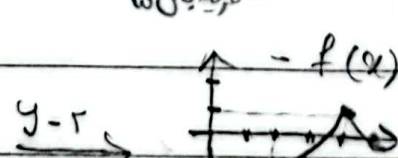
$$\Rightarrow -1 - r = r-4 \quad \checkmark$$



$$\Rightarrow y = r - f(r-x) \quad x \in [1, 2]$$



$$r - f(x+r)$$



(2)



$$f(x) = \left| \frac{x+1}{2x+1} \right| \xrightarrow{\text{عوضه، ساده سازی}} \left| \frac{(x-1)+1}{2(x-1)+1} \right| = \left| \frac{x-1}{2x-1} \right| \quad (9)$$

$$y+1 \rightarrow \left| \frac{x-1}{2x-1} \right| + 1 = g(x)$$

1,0

$$x + g(x) < 0 \rightarrow x + \left| \frac{x-1}{2x-1} \right| + 1 < 0$$

	①	$\frac{1}{2}$	
تعیین علامت	$x + \frac{x-1}{2x-1} + 1 < 0$	$x + \frac{1-x}{2x-1} + 1 < 0$	$x + \frac{x-1}{2x-1} + 1 < 0$
	$\downarrow$	$\downarrow$	$\downarrow$
	$2x^2 - 2x + x - 1 + 2x - 1$	$2x^2 - 2x + 1 - x + 2x - 1$	$2x^2 - 2x + x - 1 + 2x - 1$
	$\downarrow$	$\downarrow$	$\downarrow$
	$2x^2 - x - 2 < 0$	$2x^2 - 2x - 2 < 0$	$2x^2 - x - 2 < 0$
	$\downarrow$	$\downarrow$	$\downarrow$
	$\frac{-\sqrt{5}}{2} < x < \frac{\sqrt{5}}{2}$	$\frac{1-\sqrt{5}}{2} < x < \frac{1+\sqrt{5}}{2}$	$\frac{-\sqrt{5}}{2} < x < \frac{\sqrt{5}}{2}$
	$\downarrow$	$\downarrow$	$\downarrow$
	$x < 1$	$1 < x < \frac{1}{2}$	$x > \frac{1}{2}$
	$(-\infty, -\sqrt{5})$	$[1+\sqrt{5}, \frac{1}{2})$	$\emptyset$

$$\Rightarrow (-\infty, -\sqrt{5}) \cup [1+\sqrt{5}, \frac{1}{2}) \rightarrow 2.$$

$$x < -1$$



$$f(x) = \frac{\sqrt{v}}{\lambda} (x-1)^{\frac{v}{\lambda}} + \sqrt{v}$$

$$D_f = [0, 1/\sqrt{v}]$$

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① چون نمودار از (0,0) گذشته و فقط یک نقطه دارد پس $f(x)$ →

$$a x^c = f(x) \rightarrow x=1 \rightarrow a = \sqrt{v} \rightarrow a = \frac{\sqrt{v}}{\lambda}$$

$$\rightarrow f(x) = \frac{\sqrt{v}}{\lambda} x^{\frac{v}{\lambda}}$$

$$\rightarrow \sqrt{\lambda f(x) - f^{\frac{v}{\lambda}}(x)} = g(x) \rightarrow \sqrt{\lambda \frac{\sqrt{v}}{\lambda} x^{\frac{v}{\lambda}} - \left(\frac{\sqrt{v}}{\lambda} x^{\frac{v}{\lambda}}\right)^{\frac{v}{\lambda}}}$$

$$\rightarrow \lambda \frac{\sqrt{v}}{\lambda} x^{\frac{v}{\lambda}} - \left(\frac{\sqrt{v}}{\lambda}\right)^{\frac{v}{\lambda}} x^{\frac{v}{\lambda}} \geq 0 \rightarrow x^{\frac{v}{\lambda}} \left(\lambda \sqrt{v} - \left(\frac{\sqrt{v}}{\lambda}\right)^{\frac{v}{\lambda}} x^{\frac{v}{\lambda}} \right) \geq 0$$

تغییرات $g(x)$

	0	$\frac{\lambda}{\sqrt{v}}$	
-		+	•

$$\rightarrow D_f = \left[0, \frac{\lambda}{\sqrt{v}}\right] \rightarrow 1.$$