

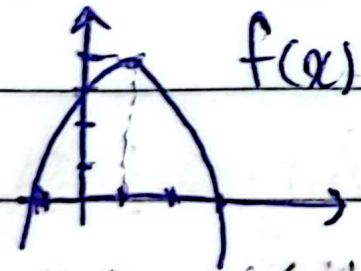
$$y = -\frac{1}{x}x^2 + \frac{5}{x}x + 1 \rightarrow (x, y) = \text{ext} \quad (1)$$

مقادیر جدید $\rightarrow -\frac{1}{x}(x-5) + 5 = y \Rightarrow -\frac{1}{x}(x-5)^2 = 4 > 0 \rightarrow (x-5)^2 = 9$

$$x-5 = 3 \rightarrow x = 8$$

$$x-5 = -3 \rightarrow x = 2 \Rightarrow 2$$

$f(x)$ و $y = 1 - 2f(2x+5)$ $\rightarrow (x, B)$ و $x, B = ?$ (2)



$f(x)$ $\rightarrow (1, 4)$ $\xrightarrow{x+5} (-1, 4)$

$x \times 2$ $\rightarrow (-\frac{1}{2}, 4)$ $\xrightarrow{y \times 2} (-\frac{1}{2}, 8)$ $\xrightarrow{y+1} (-\frac{1}{2}, 9)$ $\xrightarrow{x \times 2} (-1, 9)$ $\xrightarrow{y \times 2} (-1, 18)$ $\xrightarrow{y+1} (-1, 19)$

$x \times B = -\frac{1}{x}x - 1 = -\frac{1}{1} = -1 \Rightarrow 2$

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

$$\frac{\text{قریبی}}{\text{و } x} \rightarrow -(3 - \sqrt{2x+2}) = \sqrt{2x+2} - 3 \xrightarrow{\text{و } 10 \text{ و } 6} \sqrt{2x+2} - 3 + 2$$

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

$$f(x) = \frac{1}{x} \rightarrow \sqrt{2x+2} + 2 = \frac{1}{x} \rightarrow \sqrt{2x+2} = \frac{1}{x} - 2 \rightarrow 2x+2 = \frac{1}{x^2} - 4$$

$$2x = \frac{1}{x^2} \rightarrow x = \frac{1}{\sqrt{2}} \rightarrow ?$$

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

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

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

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

$$\Rightarrow a-b = -3-1 = -4 \rightarrow ?$$

$$y = f\left(\frac{x}{2} + 1\right) \text{ و } D(y, \sqrt{|2f(x)-5|}) = ? \quad (3)$$

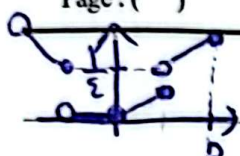
$$\frac{\text{داده } x}{\text{و } 1} \rightarrow 2 \leq x \leq 5 \xrightarrow{x \times \frac{1}{2}} -1 \leq \frac{x}{2} \leq \frac{5}{2} \xrightarrow{\frac{x}{2} + 1} -\frac{1}{2} \leq \frac{x}{2} + 1 \leq \frac{7}{2}$$

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

$$-1 \leq f(x) \leq 2 \xrightarrow{f(x) \times 2} -2 \leq 2f(x) \leq 4 \xrightarrow{2f(x)-5} -7 \leq 2f(x)-5 \leq -1$$

$$\frac{\text{مقدار مثبت و صفر}}{\text{و } 1} \rightarrow 0 \leq |2f(x)-5| \leq 7 \xrightarrow{\text{مقدار مثبت و صفر}} 0 \leq \sqrt{|2f(x)-5|} \leq \sqrt{7}$$

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



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

(4)

(a < 0)

برای کسین مقدار a ما $\frac{1}{a}$ تا $\frac{1}{a}$ بازه بندی کنیم:

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

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

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

$$\rightarrow b-a = \sqrt{2} - (-\sqrt{2}) = 2\sqrt{2}$$

$$f(x) = \log_r x \xrightarrow{\text{رابطه به هم}} \log_r (x+2) \xrightarrow{\text{قریبیت به 0}} -\log_r (x+2) \quad (5)$$

$$\xrightarrow{\text{رابطه به هم}} -\log_r (x+2) + 2 \xrightarrow{\text{قریبیت به 0}} -\log_r (-x+2) + 2$$

$$\rightarrow g(x) = -\log_r (-x+2) + 2 \quad \rightarrow g(-12) = -\log_r 14 + 2 = -2 + 2 = 0$$

$$\rightarrow g(-42) = -\log_r 44 + 2 = -4 + 2 = -2$$

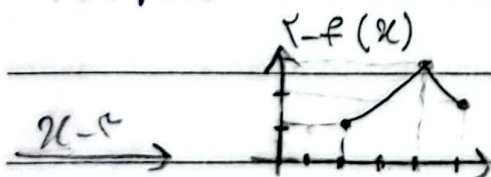
$$\Rightarrow -1 - 2 = -3 \rightarrow ?$$



$$\Rightarrow y = 2 - f(2-x) \quad \text{و} \quad x-1$$



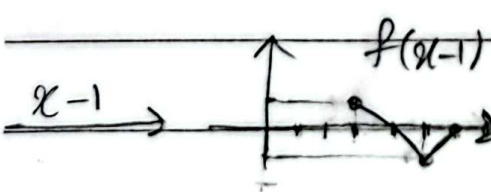
$$y = 2 - f(x+1) \quad (6)$$



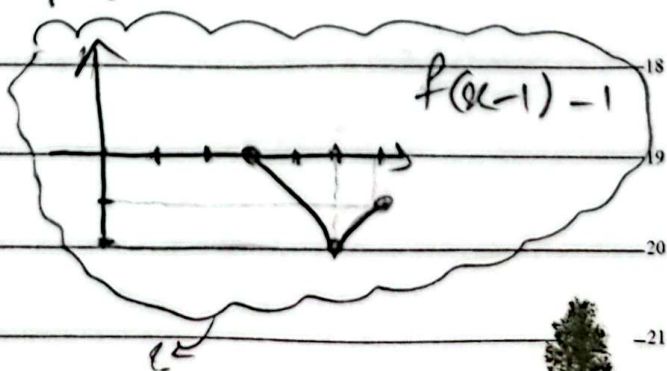
$$y = 2$$



$$y = x-1$$



$$y = 1$$



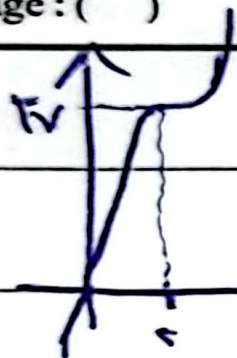
$$f(x) = \left| \frac{x+1}{2x+1} \right| \xrightarrow{\text{عوضه، بسط و ساده کردن}} \left| \frac{(x-1)+1}{2(x-1)+1} \right| = \left| \frac{x-1}{2x-1} \right| \quad (9)$$

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

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

①	②	③
$x + \frac{x-1}{2x-1} + 1 < 0$	$x + \frac{1-x}{2x-1} + 1 < 0$	$x + \frac{x-1}{2x-1} + 1 < 0$
$\downarrow$	$\downarrow$	$\downarrow$
$\frac{2x^2 - 2x + x - 1 + 2x - 1}{2x - 1}$	$\frac{2x^2 - 2x + 1 - x + 2x - 1}{2x - 1}$	$\frac{2x^2 - 2x + x - 1 + 2x - 1}{2x - 1}$
$\downarrow$	$\downarrow$	$\downarrow$
$\frac{2x^2 - 1}{2x - 1} < 0$	$\frac{2x^2 - 2x - 1}{2x - 1} < 0$	$\frac{2x^2 - 1}{2x - 1} < 0$
$\downarrow$	$\downarrow$	$\downarrow$
$\frac{-\sqrt{1} \quad \sqrt{1} \quad \frac{1}{2}}{-1 + 1 - \frac{1}{2}}$	$\frac{-1 + \sqrt{5} \quad 1 + \sqrt{5} \quad \frac{2}{2}}{-1 + 1 - \frac{1}{2}}$	$\frac{-\sqrt{1} \quad \sqrt{1} \quad \frac{1}{2}}{-1 + 1 - \frac{1}{2}}$
$\downarrow \textcircled{\wedge} x \leq 1$	$\downarrow \textcircled{\wedge} 1 < x \leq \frac{5}{2}$	$\downarrow \textcircled{\wedge} x \geq \frac{5}{2}$
$(-\infty, 1]$	$(1, \frac{5}{2}]$	$\emptyset$

$$\Rightarrow (-\infty, 1] \cup (1, \frac{5}{2}] \rightarrow 2.$$



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

$$a x^2 = f(x) \rightarrow x=2 \rightarrow 1a = 2v \rightarrow a = \frac{2v}{1}$$

$$\rightarrow f(x) = \frac{2v}{1} x^2$$

$$\rightarrow \sqrt{1a f(x) - f^2(x)} = g(x) \rightarrow \sqrt{2 \times \frac{2v}{1} x^2 - \left(\frac{2v}{1} x^2\right)^2}$$

$$\rightarrow 2 \times \frac{2v}{1} x^2 - \left(\frac{2v}{1}\right)^2 x^4 \geq 0 \rightarrow x^2 \left(2 \times \frac{2v}{1} - \left(\frac{2v}{1}\right)^2 x^2\right) \geq 0$$

تغییرات $g(x)$

	0	$\frac{2}{\sqrt{2}}$
	$-$	$+$

$$\rightarrow Df = \left[0, \frac{2}{\sqrt{2}}\right] \rightarrow 1.$$