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$$y = -\frac{1}{3}x^2 + \frac{2}{5}x + 1 \quad \left| \begin{array}{l} \frac{3}{5} = -\frac{b}{a} \\ \frac{-4}{5} = \frac{2a}{5} \end{array} \right. \quad \begin{array}{l} \text{این رأس سیمی} \\ \text{قرار به اوج رأس} \\ \text{سیم با انتقال} \\ \text{طایفه می شود} \end{array} \quad \left| \begin{array}{l} 4 \\ 3 \end{array} \right.$$

$$\frac{3}{5} + x = 4 \rightarrow x = \frac{11}{5} \quad \begin{array}{l} \text{ست} \\ \text{راست} \end{array} \rightarrow x = \frac{11}{5} \text{ به جای } x \text{ باید بگذاریم} \quad (1)$$

$$\xrightarrow{(1),(2)} y' = -\frac{1}{3} \left(x - \frac{11}{5}\right)^2 + \frac{2}{5} \left(x - \frac{11}{5}\right) + \frac{17}{25}$$

$$\frac{28}{25} + y = 3 \rightarrow y = \frac{17}{25} \rightarrow \text{باید نمودار را } \frac{17}{25} \text{ به } \frac{4}{25} \text{ ست بالا انتقال دهیم} \quad (2)$$

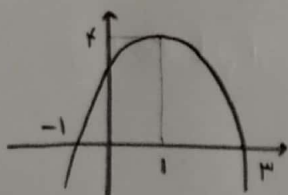
$$\begin{aligned} -\frac{1}{3} \left(x^2 + \frac{28}{25} - \frac{34}{5}x\right) + \frac{2}{5}x - \frac{24}{25} + \frac{17}{25} &= -\frac{1}{3}x^2 - \frac{28}{75} + \frac{34}{15}x + \frac{4}{15}x + \frac{17}{25} \\ &= -\frac{1}{3}x^2 + \frac{40}{15}x - \frac{11}{25} = -\frac{1}{3}x^2 + \frac{8}{3}x - \frac{11}{25} \end{aligned}$$

$$y' = -\frac{1}{3}x^2 + \frac{8}{3}x - \frac{11}{25} \quad \begin{array}{l} \text{صورت منفی} \\ \text{ریشه ها را می خواهم} \end{array} : -\frac{1}{3}x^2 + \frac{8}{3}x - \frac{11}{25} = 0 \rightarrow -x^2 + 8x - 11 = 0$$

$$\xrightarrow{\times -1} x^2 - 8x + 11 = 0 \rightarrow (x-7)(x-1) = 0$$

$$\checkmark \rightarrow x = 7, 1$$

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$$y = a(x-x_1)(x-x_2) \rightarrow y = a(x+1)(x-3) \xrightarrow{(1,f)} f = a(2)(-2) \rightarrow$$

$$\rightarrow y = -(x+1)(x-3) \Rightarrow y = -x^2 + 2x + 3 = f(x)$$

$a = -1$

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$$\begin{array}{l} \text{برای} \\ \text{به دست آوردن} \end{array} g(x) = 1 - 2f(3x+2) : f(x) = -x^2 + 2x + 3 \xrightarrow{x \rightarrow 3x+2} f(3x+2) = -(3x+2)^2 + 2(3x+2) + 3$$

$$\xrightarrow{\times -2} = 2(3x+2)^2 + f(3x+2) - 4 \xrightarrow{+1} = 2(3x+2)^2 + f(3x+2) - 3 \rightarrow g(x) = 18x^2 + 36x + 11$$

$$\left| \begin{array}{l} \frac{-b}{2a} = \frac{-36}{18} = -2 = \alpha \\ f\left(\frac{-b}{2a}\right) = -11 = \beta \end{array} \right.$$

$$\rightarrow \alpha \cdot \beta = 11$$

$$\alpha = -\frac{1}{3} \\ \beta = -11$$

$$\alpha\beta = \frac{11}{3}$$

$$y = 3 - \sqrt{2x} \xrightarrow{x \rightarrow x+1} y = 3 - \sqrt{2x+2} \xrightarrow{x-1} y = -3 + \sqrt{2x+2} \xrightarrow{+\Delta} y = \sqrt{2x+2} + 2$$

فواصله سوال: $\sqrt{2x+2} + 2 = \frac{y}{2} \rightarrow \sqrt{2x+2} = \frac{y}{2} \xrightarrow{||^2} 2x+2 = \frac{y^2}{4} \rightarrow 2x = \frac{y^2}{4} - 2 \rightarrow x = \frac{y^2}{8} - 1$

$$D_f = (a, 4] , D_g = [-1, b)$$

$$y = f(x+1) + g(x+1) = h(x) \xrightarrow[\text{به فرق}]{\text{بافزودن}} D_h = (-2, \Delta) \rightarrow D_{f(x-1)} \cap D_{g(x+1)} = (-2, \Delta)$$

$$D_{f(x)} : a < x \leq 4 \xrightarrow{x \rightarrow x-1} a+1 < x-1 \leq \Delta \rightarrow D_{f(x-1)} : (a+1, \Delta]$$

$$D_{g(x)} : -1 \leq x < b \xrightarrow{x \rightarrow x+1} -2 \leq x+1 < b+1 \rightarrow D_{g(x+1)} : [-2, b+1)$$

$$D_{f(x-1)} : \text{---} \Delta$$

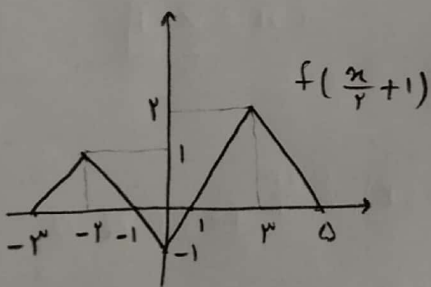
$$\cap \xrightarrow{\text{به تقاطع}} \text{---} \Delta$$

$$D_{f(x-1)} : \text{---} \Delta \quad (1)$$

$$D_{g(x+1)} : \text{---} -2$$

$$D_{g(x+1)} : \text{---} -2 \quad (2)$$

$$\textcircled{1}, \textcircled{2} \rightarrow \begin{cases} a+1 = -2 \rightarrow a = -3 \\ b-1 = \Delta \rightarrow b = \Delta+1 \end{cases} \rightarrow b-a = 4+3=7$$



$$y_1 = \sqrt{|2f(x) - 3|}$$

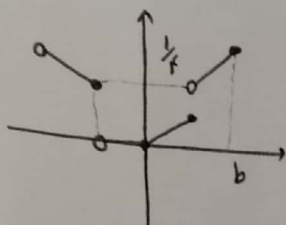
$$D_{y_1} = \mathbb{R}$$

$$R_{f(x/2+1)} = R_{f(x)} = [-1, 2]$$

$$R_{2f(x)} = 2R_{f(x)} \rightarrow R_{2f(x)} = [-2, 4] \xrightarrow{-3} [-5, 1] \xrightarrow{\text{مجموعه}} R_{|2f(x)-3|} = [0, 5]$$

$$\sqrt{} \rightarrow R_{\sqrt{|2f(x)-3|}} = [0, \sqrt{5}]$$

$$D_f = [-\frac{1}{2}, \frac{5}{2}]$$



$$y = \frac{x}{a} [ax]$$

باتوجه به قانون
برابری: $y = 0, 0 < x < \frac{1}{a}$

ضابطه ها را با توجه به نمودار $[-x]$ می نویسیم

چون این
یافتل جور
درش آید پس
①

$$\begin{cases} \frac{x}{a} & \frac{1}{a} < x < \frac{1}{a} \\ 0 & \frac{1}{a} < x < 0 \\ -\frac{x}{a} & 0 < x < \frac{1}{a} \\ -\frac{2x}{a} & -\frac{1}{a} < x < -\frac{1}{a} \end{cases} \quad (2)$$

باتوجه به
تحلیل بالا
⑤

$$f\left(\frac{1}{a}\right) = \frac{1}{f} \rightarrow \frac{1}{a} [a \times \frac{1}{a}] = \frac{1}{f} \rightarrow \frac{1}{a^2} = \frac{1}{f} \rightarrow a = \pm \sqrt{f}$$

باتوجه به
آخرین ضابطه
⑦

$$\frac{-2}{a} = b \xrightarrow{a=-2} b=1$$

②

$$\rightarrow b-a = 1+2 = 3 \quad \checkmark$$

$$f(x) = \log_p x \xrightarrow{x \rightarrow x+2} \log_p (x+2) \xrightarrow{x-1} -\log_p (x+2) \xrightarrow{+3} -\log_p (x+2) + 3 \xrightarrow{x \rightarrow -x}$$

-V

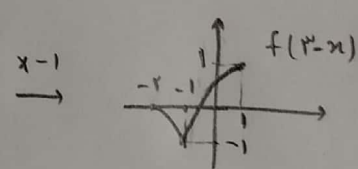
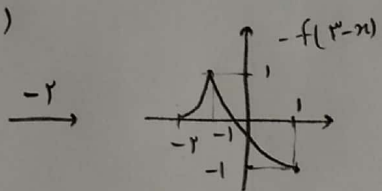
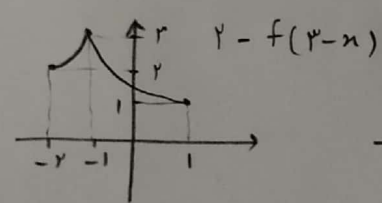
$$-\log_p (-x+2) + 3 = g(x)$$

$$g(-14) = -\log_p (14) + 3 = -\log_p 2^f + 3 = -1$$

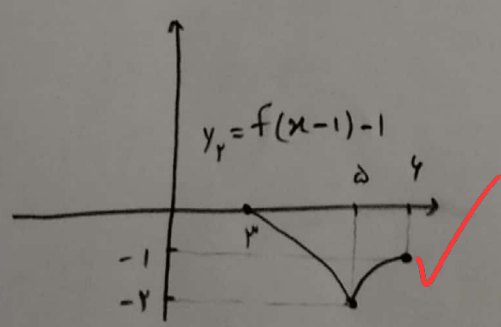
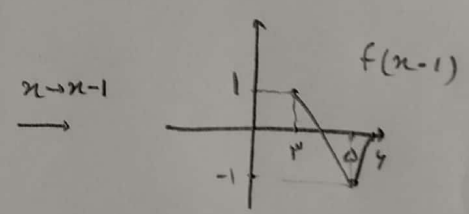
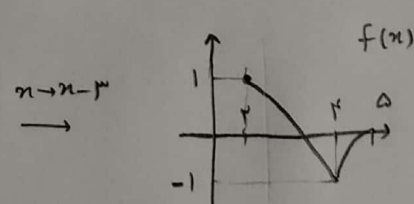
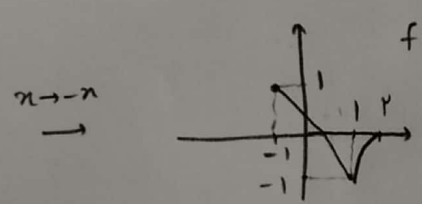
$$g(-42) = -\log_p (42) + 3 = -\log_p 2^4 + 3 = -3$$

$$\xrightarrow{+} = -f \quad \checkmark$$

②



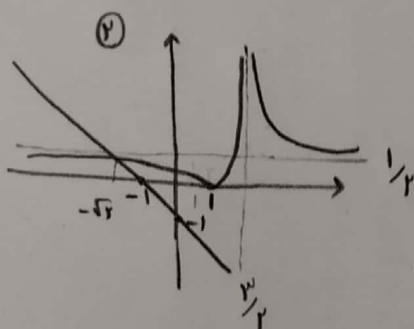
-A



②

$$f(x) = \left| \frac{x+1}{2x+1} \right| \xrightarrow{x \rightarrow x-2} f(x-2) = \left| \frac{x-1}{2x-3} \right| \xrightarrow{+1} f(x-2)+1 = g(x) = \left| \frac{x-1}{2x-3} \right| + 1$$

$$\rightarrow g(x) < -x \rightarrow \left| \frac{x-1}{2x-3} \right| + 1 < -x \rightarrow \left| \frac{x-1}{2x-3} \right| < -x-1 \quad (1)$$



باتوجه
به شکل

ریشه
برخورد
 $x < -1$

$$\rightarrow \left| \frac{x-1}{2x-3} \right| = -x-1 \rightarrow \frac{x-1}{2x-3} = -x-1$$

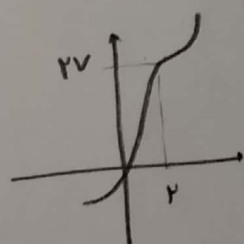
$$\rightarrow 2x^2 - x - 3 = -x + 1 \rightarrow x^2 = 2 \rightarrow x = \pm \sqrt{2} \xrightarrow{x < -1} x = -\sqrt{2}$$

باتوجه

به شکل
معادله
(1) و (2)

$$x < -\sqrt{2}$$

۲



$$g(x) = \sqrt{28f(x) - f^2(x)} \quad D_{g(x)} = -f^2(x) + 28f(x) \geq 0$$

$$f(x) = t$$

$$\rightarrow -t^2 + 28t \geq 0 \rightarrow -t(t - 28) \geq 0 \rightarrow 0 \leq t \leq 28$$

$$\rightarrow 0 \leq f(x) \leq 28 \xrightarrow[\text{شکل}]{\text{باتوجه به}} 0 \leq x \leq 2 + 28 \quad (1) \quad \checkmark$$

- چون در فرض گفته است $f(x)$ انتقال یافته x^3 است پس، [مقدار 0] می توان بیشتر از 1 باشد (مقدار 0 < 1) چون اگر بیشتر از 1 باشد $x = 3$ و چون توان 3 دارد قطعاً اختلافی آنجا یکی نیست (28-27=1) نتیجه می گیریم:

تعداد اعداد

صحیح
دامنه

$$\text{است } 2 \text{ تا } 0$$