محمد عماد عطرآبادی

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۱- تا به نقطه (٤,۳) برسیم

$y = -\frac{1}{3}x^2 + \frac{2}{5}x + 1$

ext $\left| \begin{matrix} \frac{15}{25} \\ \frac{27}{25} \end{matrix} \right.$ $\rightarrow -\frac{1}{3}(\underbrace{x-\frac{17}{5}}_{t})^2 + \frac{2}{5}(x-\frac{17}{5}) + 1 + \frac{47}{25}$

$-\frac{1}{3}t^2 + \frac{2}{5}t + \frac{72}{25} = 0 \Rightarrow t_1 = -\frac{12}{25}$

$\Rightarrow t_2 = \frac{18}{5}$

$x - \frac{17}{5} = \frac{18}{5} \rightarrow \boxed{x=7}$, $x - \frac{17}{5} = -\frac{12}{25} \rightarrow \boxed{x=1}$

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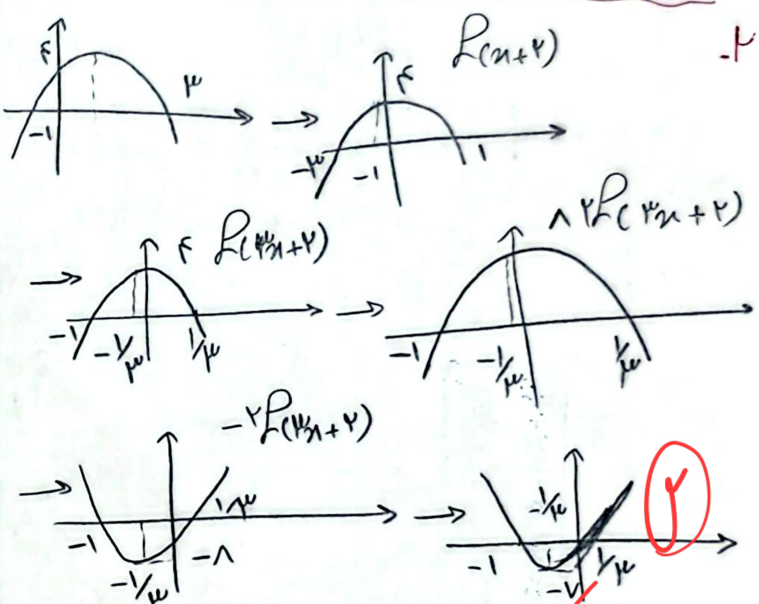

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$\Rightarrow A = (-\frac{1}{3}, -7) \rightarrow (-\frac{1}{3})(-7) = \boxed{\frac{7}{3}}$

۳-

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

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

$\xrightarrow{+5} y = \sqrt{2x+2} + 2 = \frac{7}{2} \rightarrow 2x+2 = \frac{9}{4}$

$2x = \frac{1}{4} \rightarrow \boxed{x = \frac{1}{8}}$

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$D_f \Rightarrow a \le x-1 \le 4 \rightarrow a+1 \le x \le 5$

$D_g \rightarrow -1 \le x+1 \le b \rightarrow -2 \le x \le b-1$

$\Rightarrow (-2, 5) \rightarrow a+1 = -2 \rightarrow a = -3$

$\rightarrow b-1 = 5 \rightarrow b = 6$

$a - b = -3 - 6 = \boxed{-9}$

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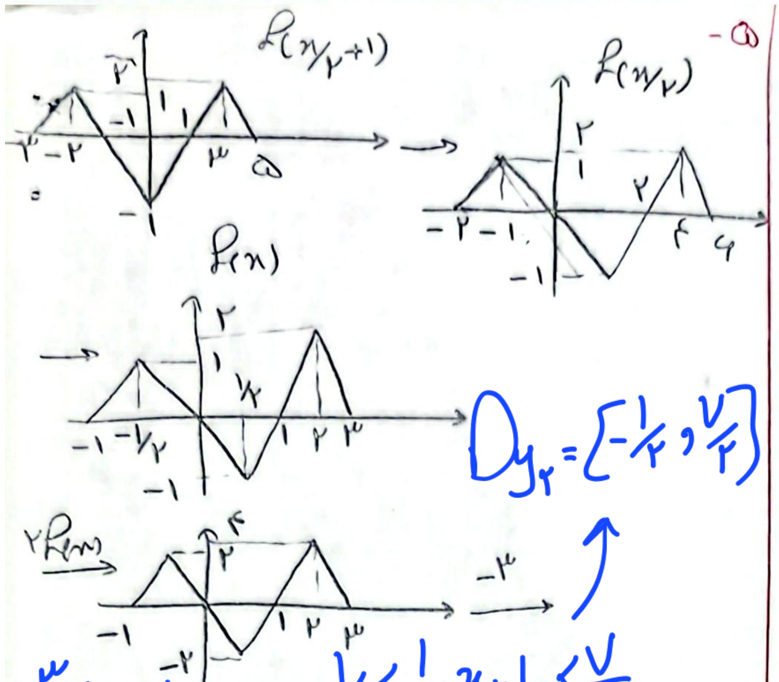
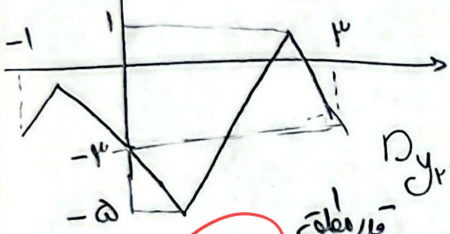


$D_{y_2} = [-\frac{1}{2}, \frac{7}{2}]$

$-3 \le x \le 5 \rightarrow -\frac{1}{2} \le \frac{1}{2}x + 1 \le \frac{7}{2}$



$D_{y_2} = [-1, 3]$

$D_{y_2} \rightarrow -5 \le y \le 1$

$\xrightarrow{\text{قدرمطلق}} 0 \le y \le 5$

$\xrightarrow{\sqrt{}} 0 \le \sqrt{y} \le \sqrt{5}$

$\Rightarrow R_{y_2} = [0, \sqrt{5}]$

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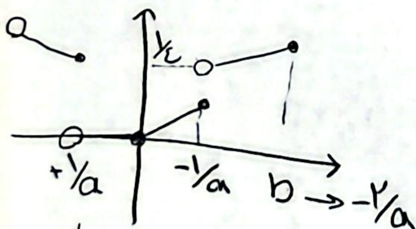

$b \rightarrow -\frac{2}{a}$

$\hookrightarrow x = \frac{1}{a} \rightarrow \frac{1}{a^2}[a \times \frac{1}{a}] \Rightarrow \frac{1}{a^2} = \frac{1}{4}$

$a = \pm 2 \rightarrow$ +۲ قبول نیست زیرا با توجه به شکل a باید کوچکتر صفر شود.

$\Rightarrow a = -2$

$b' = 1 \rightarrow b - a = 1 - (-2) = \boxed{3}$

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$$f(x)=\log_2 x \longrightarrow \log_2 (x+2) \longrightarrow -\log_2 (x+2) \longrightarrow -\log_2 (x+2)+3 \longrightarrow -\log_2 (-x+2)+3$$

$$g(x)=-\log_2 (x+2)+3$$

$$g(-62) \rightarrow -\log_2 64+3 \rightarrow \boxed{-3} \searrow -3+(-1)\boxed{-4}$$

$$g(-14) \rightarrow -\log_2 16+3=\boxed{-1} \nearrow$$

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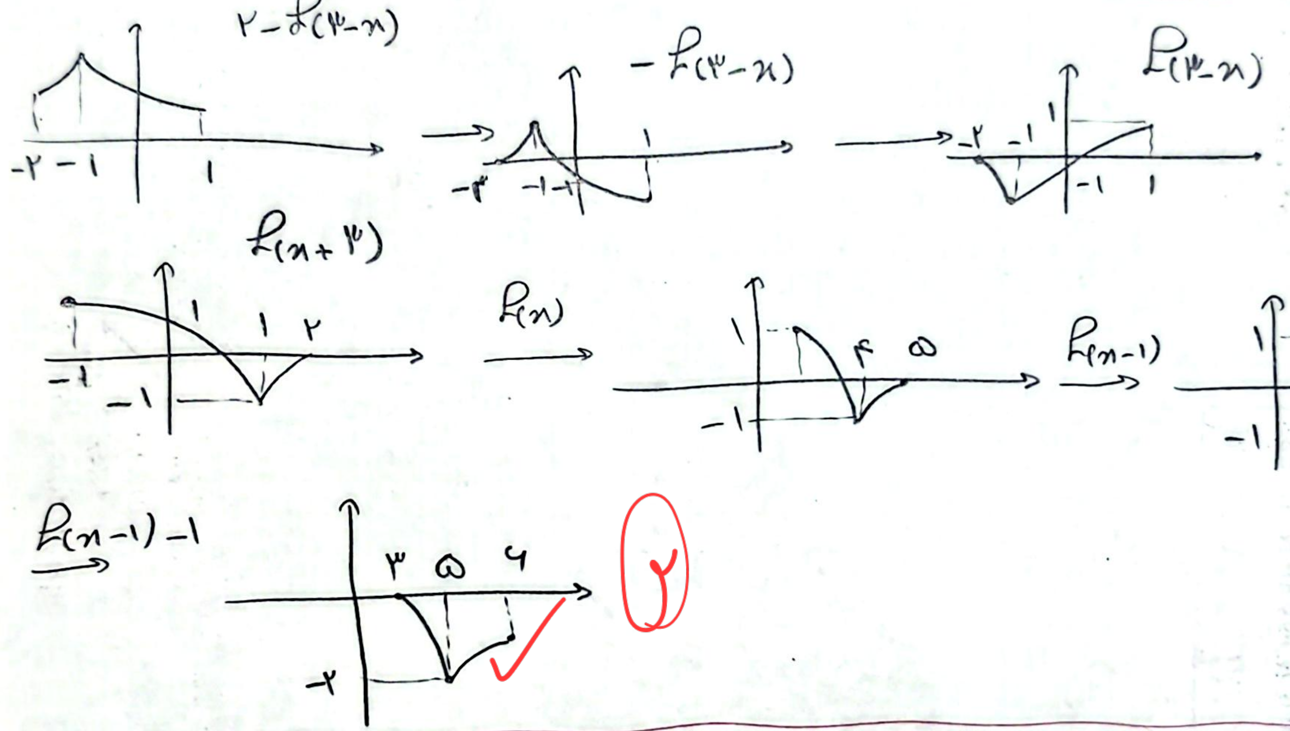

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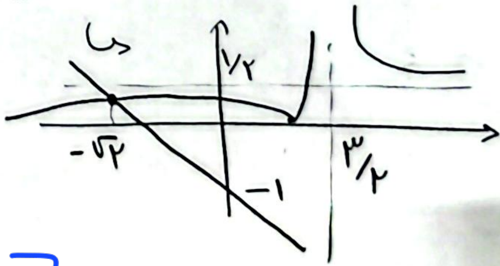
$$f(x)=\left|\frac{x+1}{2x+1}\right| \longrightarrow \left|\frac{x-2+1}{2x-4+1}\right|=\left|\frac{x-1}{2x-3}\right| \rightarrow g(x)=\left|\frac{x-1}{2x-3}\right|+1$$

$$x+g(x)\geq 0 \hookrightarrow x+\left|\frac{x+1}{2x-3}\right|+1\geq 0 \longrightarrow \left|\frac{x-1}{2x-3}\right|\geq -x-1$$

$$\frac{x-1}{2x-3}=-x-1 \rightarrow x=\pm\sqrt{2}$$

$$\hookrightarrow \boxed{x=-\sqrt{2}}$$



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$$x \in (-\infty, -\sqrt{2}]$$

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شکل ← مبدأ ازاست ← $y = \frac{27}{8}(x-2)^3 + 27$

$g(x) = \sqrt{28(f(x)) - f(x)^2} \to \sqrt{f(x)(28 - f(x))}$

t

$\to \sqrt{t(28-t)} \to t^2 - 28t \leq 0 \to$

$$\begin{array}{ccccc} & 0 & & 28 & \\ + & | & - & | & + \end{array}$$

$\to 0 \leq t \leq 28 \to 0 \leq (x-2)^3 \frac{27}{8} + 27 \leq 28 \to -27 \leq \frac{(x-2)^3 27}{8} \leq 1$

$\to -8 \leq (x-2)^3 \leq \frac{8}{27} \to -2 \leq x - 2 \leq 2/3 \to 0 \leq x \leq 8/3$

$\to x = \{0, 1, 2\} \to$ $\boxed{\text{۳ عدد}}$

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