DATE: SUB:

[illegible]

۱-

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

$\frac{-b}{2a} = \frac{3}{5} \longrightarrow y = \frac{28}{25} \longrightarrow \left(4 - \frac{3}{5}, 3 - \frac{28}{25}\right)$

$(h, k) = \left(\frac{17}{5}, \frac{47}{25}\right) \rightarrow y_{new} = -\frac{1}{3}x^2 + \frac{8}{3}x - \frac{7}{3} \rightarrow$

$\underline{x = 1, 7}$

۲-

$y = 1 - 2f(3x+2) \rightarrow 3x + 2 = 1 \rightarrow x = -\frac{1}{3}, \; y = 1 - 2f(1) = -7$

$A\left(-\frac{1}{3}, -7\right) \rightarrow \alpha\beta = \frac{7}{3}$

۳-

$y = 3 - \sqrt{2x} \longrightarrow 3 - \sqrt{2(x+1)} \rightarrow y = -\left(3 - \sqrt{2(x+1)}\right)$

$y = -3 + \sqrt{2(x+1)} \xrightarrow{+5} y = \sqrt{2(x+1)} + 2 \rightarrow y = \sqrt{2x+2} + 2 \longrightarrow$

$\sqrt{2x+2} + 2 = \frac{7}{2} \rightarrow \sqrt{2(x+1)} = \frac{3}{2} \rightarrow 2x = \frac{1}{4} \rightarrow \underline{x = \frac{1}{8}}$

۴-

$x+1 \in D_f , \; x-1 \in D_g$

$\{x \mid x-1 \in (a, 4]\}, \; \{x \mid x+1 \in [-1, b)\}$

$\rightarrow (a+1, 5] \cap [-2, b-1) \Rightarrow (-2, 5) \rightarrow a+1 = -2 \rightarrow a = -3$

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

$a - b = \underline{-9}$

Elipon

۵ - همواره برقرار است لذا دامنه R است و ← $|2f(x)-3|\geq 0$

دامنه y_2 برابر با دامنه تابع $f(x)$ است $=[-\frac{1}{2},\frac{7}{2}]$

$-1\leq f(x)\leq 2 \to -2\leq 2f(x)\leq 4 \to -5\leq 2f(x)-3\leq 1 \to$

$\to 1\leq |2f(x)-3|\leq 5 \to 1\leq\sqrt{|2f(x)-3|}\leq\sqrt{5}$

$R_{y_2}=[1,\sqrt{5}]$

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۷ - $f(x)=\log_2^x \longrightarrow \log_2^{(x+2)} \to -\log_2^{(x+2)} \to -\log_2^{(x+2)}+3 \to$

$\to -\log_2^{((-x)+2)+3} \Rightarrow g(x)=3-\log_2^{2-x}$

$g(-14)=-1$ و $g(-62)=-3 \to -1+(-3)=-4$

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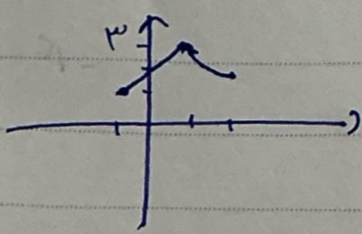
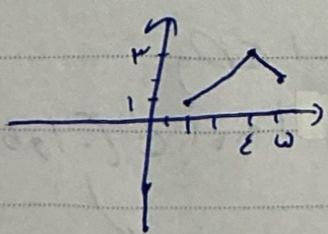
۸ -

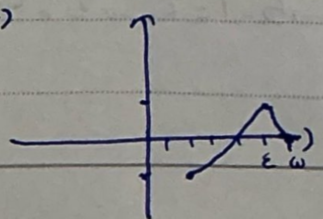
$2-f(x+3)$



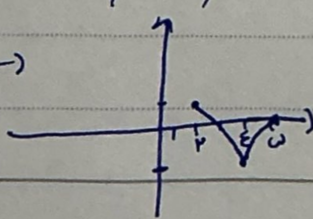
$2-f(x)$



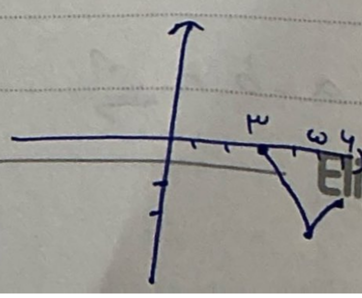
$-f(x)$



$f(x)$



$f(x-1)-1$



$$f(x) = \left|\frac{x+1}{2x+1}\right| \to g(x) = \left|\frac{(x-2)+1}{2(x-2)+1}\right| + 1 = \left|\frac{x-1}{2x-3}\right| + 1 \qquad -9$$

$$x + g(x) < 0 \to x+1 + \left|\frac{x-1}{2x-3}\right| < 0$$

$$x+1<0 \xrightarrow{\text{در بازه}} x<-1 : \; x+1 + \frac{x-1}{2x-3} < 0 \to (x+1)(2x-3) + (x-1) > 0$$

$$\to (x+1)(2x-3) = 2x^2 - x - 3 \to 2x^2 - x - 3 + x - 1 = 2x^2 - 4 \to$$

$$\to 2x^2 - 4 > 0 \to x^2 > 2 \to |x| > \sqrt{2} \; (2), \quad x<-1 \; (1)$$

$$(1) \cap (2) \to (-\infty, -\sqrt{2})$$

$$g(x) = \sqrt{28 f(x) - f^2(x)} \to 28 f(x) - f^2(x) \geq 0 \qquad -11$$

$$f(x)(28 - f(x)) \geq 0 \to f(x) \geq 0 ,\; 28 - f(x) \geq 0 \to 0 \leq f(x) \leq 28$$

فرض $f(x) = (x-2)^3 + 27 \to 0 \leq (x-2)^3 + 27 \leq 28$

$$(x-2)^3 + 27 \geq 0 \to (x-2)^3 \geq -3 \to x \geq -1$$

$$(x-2)^3 + 28 \leq 28 \to (x-2)^3 \leq 1 \to x \leq 3$$

$-1 \leq x \leq 3 \to$ شامل ۵ عدد صحیح است