هلنا محوری دوازدهم تجربی تکلیف ۷
(جمعه)

① $y = \frac{-1}{3}x^2 + \frac{2}{a}x + 1 \rightsquigarrow (4,3) = ext$

$\underset{9}{}$

$\xrightarrow[\text{جدید}]{\text{معادله}} \frac{-1}{3}(x-4) + 3 = y \xrightarrow[y=0]{} \frac{-1}{3}(x-4)^2 + 3 = 0 \to (x-4)^2 = 9$

$\left\{\begin{array}{l} x-4 = 3 \to x = 7 \\ x-4 = -3 \to x = 1 \end{array}\right\} \to$ ج.

② $y = 1 - 2f(3x+2) \xrightarrow{\text{رأس}} (\alpha, \beta)$,

, $\alpha\beta = ?$

$f(x) \xrightarrow{\text{رأس}} (1,4) \xrightarrow[\text{۲ واحد به چپ}]{x+2} (-1,4) \xrightarrow[\text{انقباض } \frac{1}{3}]{3x} (\frac{-1}{3}, 4) \xrightarrow{y \times -2} (\frac{-1}{3}, -8) \xrightarrow{y+1} (\frac{-1}{3}, -7)$

$\alpha \quad \beta$

$\alpha\beta = \frac{-1}{3} \times -7 = \frac{7}{3} \to$ ج.

③ $y = 3 - \sqrt{2x} \xrightarrow[\text{۱ واحد به چپ}]{} 3 - \sqrt{2(x+1)} = 3 - \sqrt{2x+2} \xrightarrow[x \text{ محور}]{\text{قرینه نسبت به}} -(3 - \sqrt{2x+2}) = \sqrt{2x+2} - 3 \xrightarrow[\text{بالا}]{\text{۵ واحد به}} \sqrt{2x+2} - 3 + 5$

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

$f(x) = \frac{7}{2} \to \sqrt{2x+2} + 2 = \frac{7}{2} \to \sqrt{2x+2} = \frac{3}{2} \to 2x + 2 = \frac{9}{4} \to 2x = \frac{1}{4} \to x = \frac{1}{8} \to$ ج.

④ $D_f = (a, 4]$, $D_g = [-1, b)$, $y = f(x-1) + g(x+1) \to x \in (-2, 5)$ $\quad a - b = ?$

① $f(x-1) \Rightarrow a < x-1 \leq 4 \to a+1 < x \leq 5 \to D_{f(x-1)} \in (a+1, 5]$

② $g(x+1) \Rightarrow -1 \leq x+1 < b \to -2 < x < b-1 \to D_{g(x+1)} \in [-2, b-1)$

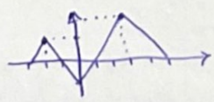
$\to \cap \to (a+1, 5] \cap [-2, b-1) = (-2, 5)$

$\to a+1 = -2 \to a = -3$

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

$a - b = -3 - 6 = -9 \to$ ج

⑤ $y_1 = f(\frac{x}{2} + 1)$, $D(y_2 = \sqrt{|2f(x) - 3|}) = ?$

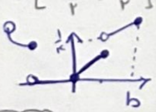


$\xrightarrow{\text{براساس شکل}} -3 \leq x \leq 5 \xrightarrow{x \times \frac{1}{2}} \frac{-3}{2} \leq \frac{x}{2} \leq \frac{5}{2} \xrightarrow{\frac{x}{2}+1} \frac{-1}{2} \leq \frac{x}{2} + 1 \leq \frac{7}{2}$

$|2f(x) - 3| \geq 0 \to$ همواره برقرار است.

$-1 \leq f(x) \leq 2 \xrightarrow{f(x) \times 2} -2 \leq 2f(x) \leq 4 \xrightarrow{2f(x)-3} -5 \leq 2f(x) - 3 \leq 1 \xrightarrow{\text{اعمال قدرمطلق}} 0 \leq |2f(x) - 3| \leq 5 \xrightarrow[\text{رادیکال}]{\text{اعمال}} 0 \leq \sqrt{|2f(x) - 3|} \leq \sqrt{5}$

$D_{y_2} = [\frac{-1}{2}, \frac{7}{2}]$, $R_{y_2} = [0, \sqrt{5}] \to$ ج.

⑥ 

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

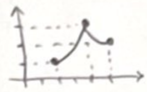
$a < 0$

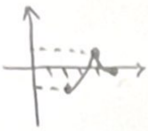
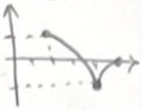
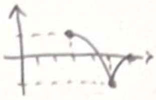
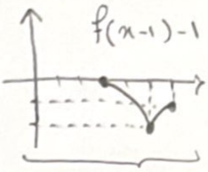
برای نشستن نمودار باید x ها را $\frac{1}{a}$ تا $\frac{1}{a}$ بازه بندی کنیم:

$(\frac{-1}{a}, 0] \in x \to x$

(7) $f(x) = \log_2 x \xrightarrow[\text{۲ واحد به چپ}]{} \log_2 (x+2) \xrightarrow[\text{x ها}]{\text{قرینه نسبت}} -\log_2 (x+2) \xrightarrow[\text{۳ واحد بالا}]{} -\log_2 (x+2) + 3 \xrightarrow[\text{به y ها}]{\text{قرینه نسبت}} -\log_2 (-x+2) + 3$

$\rightarrow g(x) = -\log_2 (-x+2) + 3 \begin{cases} \rightarrow g(-14) = -\log_2 16 + 3 = -4 + 3 = -1 \\ \rightarrow g(-62) = -\log_2 64 + 3 = -6 + 3 = -3 \end{cases} \Rightarrow -1 - 3 = -4 \rightarrow$ ج.

(8)  $\Rightarrow y_1 = 2 - f(3-x) \xrightarrow[\text{به y ها}]{\text{قرینه نسبت}}$  $2 - f(x+3) \xrightarrow{x-3}$  $2 - f(x)$

$\xrightarrow{y-2}$  $-f(x) \xrightarrow{y\times -1}$  $f(x) \xrightarrow{x-1}$  $f(x-1) \xrightarrow{y-1}$  $f(x-1)-1$

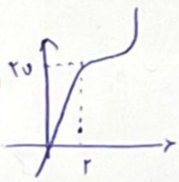
ج.

(9) $f(x) = \left|\frac{x+1}{2x+1}\right| \xrightarrow{\text{۲ واحد به راست}} \left|\frac{(x-2)+1}{2(x-2)+1}\right| = \left|\frac{x-1}{2x-3}\right| \xrightarrow{y+1} \left|\frac{x-1}{2x-3}\right| + 1 = g(x)$

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

$x \le 1$	$1 < x < \frac{3}{2}$	$x \ge \frac{3}{2}$
$x + \frac{x-1}{2x-3} + 1 < 0$	$x + \frac{1-x}{2x-3} + 1 < 0$	$x + \frac{x-1}{2x-3} + 1 < 0$
$\frac{2x^2 - 3x + x - 1 + 2x - 3}{2x-3} < 0$	$\frac{2x^2 - 3x + 1 - x + 2x - 3}{2x-3} < 0$	$\frac{2x^2 - 3x + x - 1 + 2x - 3}{2x-3} < 0$
$\frac{2x^2 - 4}{2x-3} < 0$	$\frac{2x^2 - 2x - 2}{2x-3} < 0$	$\frac{2x^2 - 4}{2x-3} < 0$
$-\sqrt{2}, \sqrt{2}, \frac{3}{2}$: $- + - +$	$\frac{1-\sqrt{5}}{2}, \frac{1+\sqrt{5}}{2}, \frac{3}{2}$: $- + - +$	$-\sqrt{2}, \sqrt{2}, \frac{3}{2}$: $- + - +$
$\cap\ x \le 1$	$\cap\ 1 \le x \le \frac{3}{2}$	$\cap\ x \ge \frac{3}{2}$
$(-\infty, -\sqrt{2}]$	$[\frac{1+\sqrt{5}}{2}, \frac{3}{2})$	$\varnothing$

$\Rightarrow \cup \Rightarrow (-\infty, -\sqrt{2}] \cup [\frac{1+\sqrt{5}}{2}, \frac{3}{2}) \rightarrow$ ج

(10)  $f(x)$

چون نمودار از $(0,0)$ گذشته پس فقط ax^3 شده

$ax^3 = f(x) \rightarrow x = 2 \rightarrow 8a = 27 \rightarrow a = \frac{27}{8} \rightarrow f(x) = \frac{27}{8} x^3 \rightarrow \sqrt{28 f(x) - f^2(x)} = g(x)$

$\rightarrow \sqrt{28 \times \frac{27}{8} x^3 - (\frac{27}{8} x^3)^2} \rightarrow 7 \times 27 x^3 - (\frac{27}{8})^2 x^6 \ge 0 \rightarrow x^3 (7 \times 27 - (\frac{27}{8})^2 x^3) \ge 0$

$\xrightarrow{\text{تعیین علامت}}$ $0, \frac{4}{3}\sqrt{7}$: $- + -$ $\rightarrow D_f = [0, \frac{4}{3}\sqrt{7}] \rightarrow$ ج.