تکلیف ششم یازدهم ریاضی [C]

نام: رضایی

(۱)

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

$y - 1 = (x-1)^3 \to \sqrt[3]{y-1} = x - 1$

$x = \sqrt[3]{y-1} + 1 \to R_f = \mathbb{R}$

ب) $y = \frac{1}{x^2 - 2x}$ $\quad yx^2 - 2yx - 1 = 0 \to \Delta = 4y^2 - 4(-1 \times y) = 4y^2 + 4y$

$x = \frac{+2y \pm \sqrt{4y^2 + 4y}}{2y}$ $\quad 4y^2 + 4y \geq 0$

$4y(y+1) \geq 0$ $\quad$ $-1 \quad 0$; $+ \; - \; +$

$\to y \neq 0$ (II) $\quad (-\infty, -1] \cup [0, +\infty)$ (I)

(I), (II) $\to R_f = (-\infty, -1] \cup (0, +\infty)$

(۲)

الف) $y = x^2 - 4x + 10$ $\quad x_{min} = \frac{-b}{2a} = 2, \; y = 6$ $\quad R_f = [6, +\infty)$

ب) $y = -x^2 + 6x + 3$ $\quad x_{max} = \frac{-b}{2a} = +3, \; y = 12$ $\quad R_f = (-\infty, 12]$

ج) $y = \sqrt{x^2 - 4x - 3}$ $\quad x_{min} = \frac{-b}{2a} = 2, \; y = -7$ $\quad R_f = \sqrt{[-7, +\infty)} \to [0, +\infty)$

د) $y = \sqrt{6x - x^2}$ $\quad$ $-x^2 + 6x$ $\quad x_{max} = \frac{-b}{2a} = 3, \; y = 9$ $\quad R_f = \sqrt{(-\infty, 9]} \to [0, 3]$

(۳)

الف) $y = x^3 - 5x^2 + 3x + 1 \to R_f = \mathbb{R}$

ب) $y = x^7 - 6x^4 - 3x + 2 \to R_f = \mathbb{R}$

ج) $y = \sqrt{x^7 - 6x^2 + 5x + 1} \to R_f = [0, +\infty)$

د) $y = (x^{\infty} - 4x^2 + 3x + 1)^2 \to R_f = [0, +\infty)$

(۴)

الف) $y = \frac{3x + 1}{x - 2}$ $\quad R_f = \mathbb{R} - \{3\}$

ب) $y = \frac{2x + 1}{x + 1}$ $\quad R_f = \mathbb{R} - \{2\}$

⑤

الف) $y = \sqrt{\frac{2x+4}{x-1}}$ $\quad R_f = \sqrt{\mathbb{R}-\{2\}} \rightarrow [0,+\infty)-\{2\}$

ب) $y = \sqrt{\frac{3x+1}{2-x}}$ $\quad R_f = \sqrt{\mathbb{R}-\{-3\}} \rightarrow [0,+\infty)$

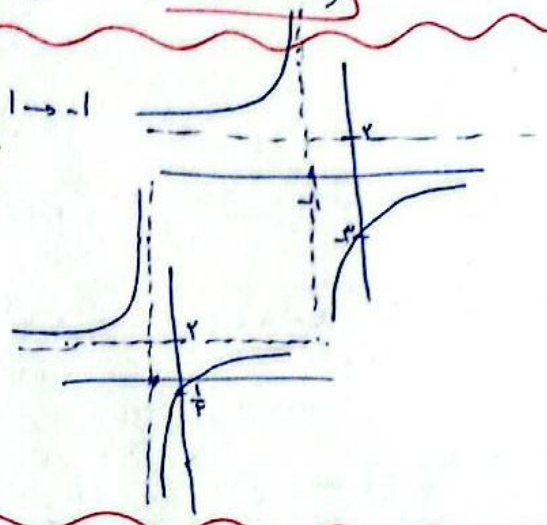
⑥

الف) $y = \frac{2x-3}{x+1}$ $\quad$ مجانب قائم $= x+1 \rightarrow -1$ $\quad$ مجانب افقی $= 2$

$x=0 \rightarrow x=-3$

ب) $y = \frac{2x-1}{x+2}$ $\quad$ مجانب قائم $= -2$ $\quad$ مجانب افقی $= 2$

$\hookrightarrow x=0 \rightarrow \frac{-1}{2}$



⑦

الف) $y = \sin x + \frac{1}{\sin x}$ $\quad R_f = (-\infty,-2] \cup [2,+\infty)$

ب) $y = \frac{x^2+1}{x^2} \rightarrow x^2 + \frac{1}{x^2} \rightarrow R_f = (-\infty,-2] \cup [2,+\infty)$

ج) $y = \frac{\sqrt[3]{x^2}+1}{\sqrt[3]{x}} \Rightarrow \sqrt[3]{\frac{x^2}{x}} + \frac{1}{\sqrt[3]{x}} \rightarrow \sqrt[3]{x} + \frac{1}{\sqrt[3]{x}} \rightarrow R_f = (-\infty,-2] \cup [2,+\infty)$

د) $y = \sqrt{x} + \frac{1}{\sqrt{x}} \rightarrow R_f = [2,+\infty)$

⑧

الف) $y = x^2 + \frac{1}{x^2+3} \rightarrow x^2+3 + \frac{1}{x^2+3} - 3$

$t + \frac{1}{t} - 3 \rightarrow t + \frac{1}{t} - 3 \geq 2 \rightarrow t + \frac{1}{t} \geq 5$

$t + \frac{1}{t} \geq 2$

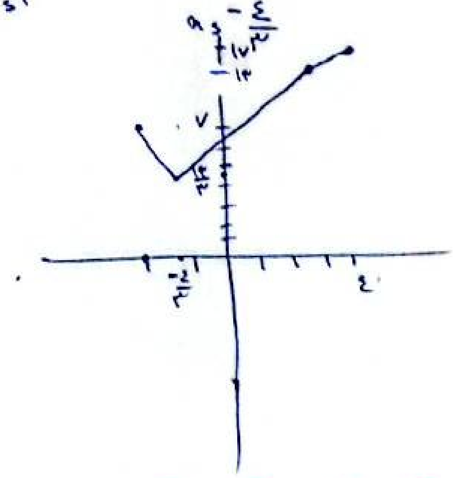
$\hookrightarrow R_f = [5,+\infty)$

ب) $y = \frac{x^2+5}{\sqrt{x^2+4}} \rightarrow \frac{x^2+4+1}{\sqrt{x^2+4}} \rightarrow \sqrt{x^2+4} + \frac{1}{\sqrt{x^2+4}} \rightarrow 2 + \frac{1}{2} = \frac{5}{2} \rightarrow R_f = [\frac{5}{2},+\infty)$

(9)

$y = |x-3| + |3x+4|$

$x_s 3$, $x = -\frac{4}{3}$



$x - 3 + 3x + 4 = 4x + 1 \qquad x > 3$

$-x + 3 + 3x + 4 = 2x + 7 \qquad -\frac{4}{3} \le x \le 3 \rightarrow 2 \times \frac{-4}{3} + 7 = \frac{13}{3}$

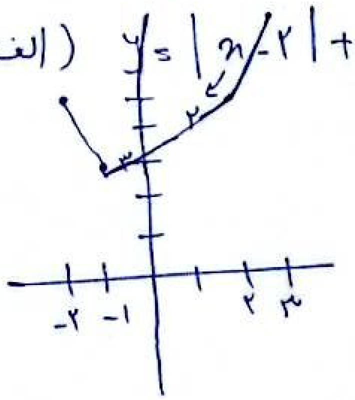
$-x + 3 - 3x - 4 = -4x - 1 \qquad x < -\frac{4}{3}$

$-4 \times \frac{-4}{3} - 1 = 7$

(10)

الف) $y = |x-2| + |2x+2|$

$x = 2$, $x = -1$



$+x - 2 + 2x + 2 = 3x \qquad x > 2$

$-x + 2 + 2x + 2 = x + 4 \qquad -1 \le x \le 2$

$-x + 2 - 2x - 2 = -3x \qquad x < -1$

$R_f = [3, +\infty)$

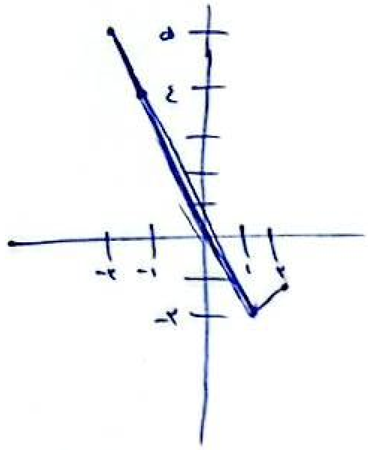
ب) $y = |2x-2| - |x+1|$

$x = 1$, $x = -1$

$2x - 2 - x - 1 = x - 3 \qquad x > 1$

$-2x + 2 - x - 1 = -3x + 1 \qquad -1 \le x \le 1$

$-2x + 2 + x + 1 = -x + 3 \qquad x < -1$



$R_f = [-2, +\infty)$