

19, 100

پرفیای باقری / پاسنامه تشریحی تکلیف شماره 4 / کلاس دهم دفتر 1A

الف) $y = \frac{x+1}{x^3 - 10x^2 + 31x - 10} = \frac{x+1}{(x-1)(x-2)(x-5)} \Rightarrow x \neq 1, \frac{1}{2}, \frac{5}{2} \Rightarrow D_f = \mathbb{R} - \{1, \frac{1}{2}, \frac{5}{2}\}$ ✓

ب) $y = \frac{x+1}{x^3 - x^2 - 12x - 4} = \frac{x+1}{(x+1)(x-2)(x+2)} \Rightarrow x \neq -1, 2, -2 \Rightarrow D_f = \mathbb{R} - \{-1, 2, -2\}$ ✓

الف) $y = \frac{x+1}{x - \sqrt{3-2x}} \rightarrow 3-2x \geq 0 \Rightarrow x \leq \frac{3}{2}, x \neq \sqrt{3-2x} \rightarrow x^2 \neq 3-2x \rightarrow x^2 + 2x - 3 \neq 0 \Rightarrow (x+3)(x-1) \neq 0 \Rightarrow x \neq -3, 1$
 $D_f = (-\infty, \frac{3}{2}] - \{1\}$

ب) $y = \frac{x+1}{x - \sqrt{3x-2}} \rightarrow 3x-2 \geq 0 \Rightarrow x \geq \frac{2}{3}, x \neq \sqrt{3x-2} \rightarrow x^2 \neq 3x-2 \rightarrow x^2 - 3x + 2 \neq 0 \Rightarrow (x-1)(x-2) \neq 0 \Rightarrow x \neq 1, 2$
 $\Rightarrow x \neq 1, 2 \Rightarrow D_f = [\frac{2}{3}, +\infty) - \{1, 2\}$

الف) $y = \frac{\sin x}{2\cos x - 1} \rightarrow 2\cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{2} \Rightarrow D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{3}\}$

ب) $y = \frac{\cos x + 1}{2\sin x + 1} \rightarrow 2\sin x + 1 \neq 0 \rightarrow \sin x \neq -\frac{1}{2} \Rightarrow D_f = \mathbb{R} - \{2k\pi - \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}\}$

ج) $y = \frac{\tan x + 1}{\cot x - 1} \rightarrow \sin x, \cos x \neq 0, \cot x - 1 \neq 0 \rightarrow \cot x \neq 1 \Rightarrow D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}\}$

د) $y = \frac{\sin x + 1}{f \sin^2 x - 1} \rightarrow f \sin^2 x - 1 \neq 0 \rightarrow \sin^2 x \neq \frac{1}{f} \rightarrow \sin x \neq \pm \frac{1}{\sqrt{f}} \Rightarrow D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{\sqrt{f}}\}$

الف) $x^2 - 5x + 4 > 0 \rightarrow (x-1)(x-4) > 0 \Rightarrow (-\infty, 1) \cup (4, +\infty)$

ب) $x^2 - 4x + 5 < 0 \rightarrow (x-1)(x-5) < 0 \Rightarrow (1, 5)$

ج) $x^2 + 4x + 5 > 0 \rightarrow (x+1)(x+5) > 0 \Rightarrow (-\infty, -5] \cup [-1, +\infty)$

د) $x^2 - 7x + 4 < 0 \rightarrow (x-1)(x-4) < 0 \Rightarrow [1, 4]$

الف) $\frac{x^2 - 3x + 2}{x - 5} < 0 \rightarrow \frac{(x-1)(x-2)}{x-5} < 0 \Rightarrow (-\infty, 1) \cup (2, 5)$

ب) $\frac{x^2 - 1}{x^2 - 4x + 5} \geq 0 \rightarrow \frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0 \Rightarrow (-\infty, -1] \cup (5, +\infty)$

الف) $y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}} = \sqrt{\frac{(x-1)(x-3)}{(x-1)(x+1)}} \rightarrow \frac{(x-1)(x-3)}{(x-1)(x+1)} \geq 0 \Rightarrow D_f = [3, +\infty)$

ب) $y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}} \rightarrow x^2 - 1 \neq 0 \rightarrow (x-1)(x+1) \neq 0 \rightarrow x \neq \pm 1 \Rightarrow D_f = \mathbb{R} - \{\pm 1\}$

الف) $y = \log(x^2 - 3x) \rightarrow x^2 - 3x > 0 \rightarrow x(x-3) > 0 \Rightarrow D_f = (-\infty, 0) \cup (3, +\infty)$

ب) $y = \log \frac{14-x}{|x|-2} \rightarrow 14-x > 0 \rightarrow x < 14, (x-x)(x+x) > 0, |x|-2 \neq 1 \rightarrow x \neq \pm 3, |x|-2 > 0 \rightarrow x > 2, x < -2$
 $\Rightarrow D_f = (-14, -2) \cup (2, 3) \cup (3, 14) - \{\pm 3\} = (-14, 3) \cup (3, -2) \cup (2, 14) \cup (14, 3)$

ج) $y = \log \frac{x^2 - 5x + 4}{10-x} \rightarrow \frac{x^2 - 5x + 4}{10-x} > 0 \rightarrow \frac{(x-1)(x-4)}{10-x} > 0 \rightarrow (1, 4) \cup (10, +\infty), 10-x > 0 \rightarrow x < 10$
 $\Rightarrow D_f = (1, 4) \cup (10, +\infty) - \{4\}$

$$y = \sqrt{x^2 - 11x + 18} + \log_x \sqrt{14 - x^2} \rightarrow x^2 - 11x + 18 > 0 \rightarrow (x-2)(x-9) > 0 \rightarrow x \in (-\infty, 2] \cup [9, +\infty)$$

$$\begin{array}{c|c} f & v \\ \hline + & - \\ \hline \end{array}$$

$$x > 0, x \neq 1, \sqrt{14 - x^2} > 0 \rightarrow 14 - x^2 > 0 \rightarrow (4-x)(4+x) > 0 \rightarrow x \in (-4, 4) \Rightarrow D_f = (0, 2] \cup [9, +\infty)$$

$$\begin{array}{c|c} -4 & 4 \\ \hline - & + \\ \hline \end{array}$$

V

$$y = \frac{x^2 - x}{x^2 + x} = \frac{x(x-1)}{x(x+1)} \rightarrow \begin{array}{c|c|c|c} -1 & 0 & 1 & \\ \hline + & - & - & + \end{array}$$

$$\begin{array}{c|c|c|c|c} x & -1 & 0 & 1 & \\ \hline x^2 - x & + & + & 0 & - \\ \hline x^2 + x & + & 0 & - & + \\ \hline x^2 - x & + & - & 0 & - \\ \hline x^2 + x & + & 0 & - & + \end{array}$$

$$\Rightarrow D_f = (-\infty, -1) \cup [1, +\infty)$$

(f)

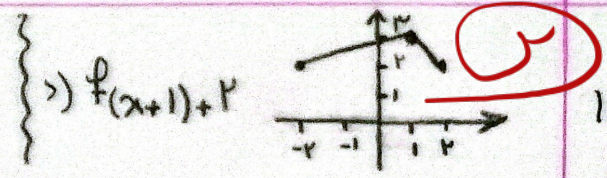
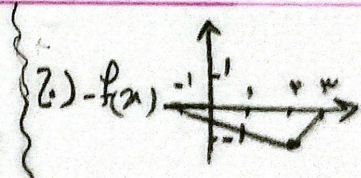
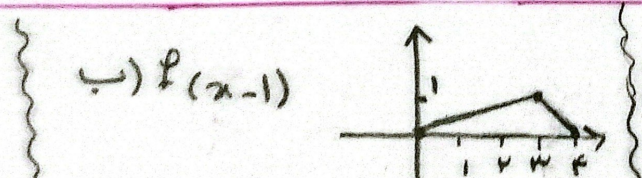
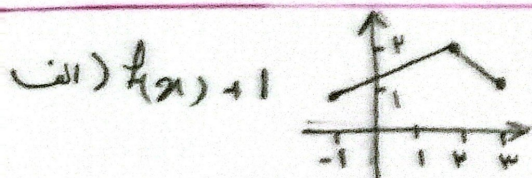
1

$$y = \sqrt{\frac{x-f(x)}{f(x)}} \rightarrow \frac{x-f(x)}{f(x)} > 0 \rightarrow x-f(x) > 0 \rightarrow x = f(x) = 3, -1 \mid f(x) \neq 0 \rightarrow x \neq \pm 1 \Rightarrow D_f = [-1, -1] \cup (1, 3]$$

$$\begin{array}{c|c|c|c} 3 & -1 & 1 & 3 \\ \hline - & + & - & + \end{array}$$

(f)

9



10