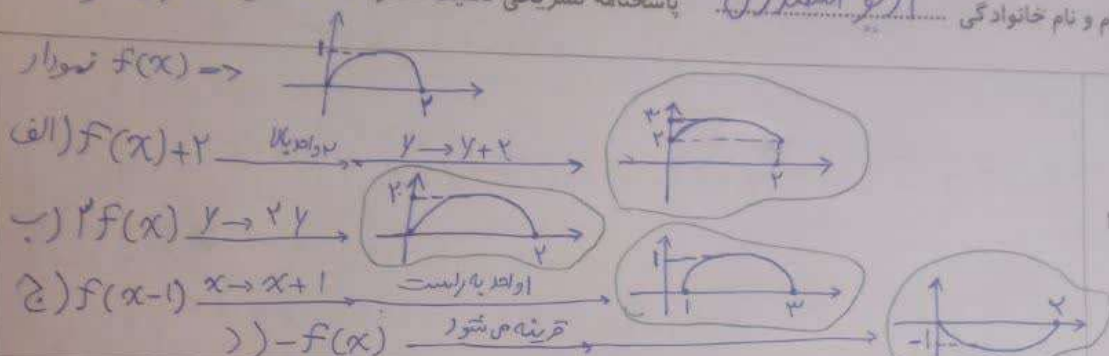


نام و نام خانوادگی: آریو اسکندر
 پاسخنامه تشریحی تکلیف شماره ۵۵ کلاس ۵۵
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الف) $x^2 - 5x + 4 > 0 \Rightarrow (x-1)(x-4) > 0 \rightarrow x=1, 4 \rightarrow \frac{1}{4} - \frac{4}{4} +$
 $(-\infty, 1) \cup (4, +\infty)$ $\leftarrow$ پاسخ جواب

ب) $x^2 - 6x + 5 < 0 \xrightarrow{a+b+c=0} \begin{cases} x=1 \rightarrow \frac{1}{4} - \frac{6}{4} + \frac{5}{4} \\ x=5 \rightarrow \frac{25}{4} - \frac{30}{4} + \frac{5}{4} \end{cases} \rightarrow (1, 5)$

ج) $x^2 + 6x + 5 \geq 0 \xrightarrow{a+c=b} \begin{cases} x=-1 \rightarrow \frac{1}{4} - \frac{6}{4} + \frac{5}{4} \\ x=-5 \rightarrow \frac{25}{4} - \frac{30}{4} + \frac{5}{4} \end{cases} \rightarrow (-\infty, -5] \cup [-1, +\infty)$

د) $x^2 - 7x + 6 \leq 0 \xrightarrow{a+b+c=0} \begin{cases} x=1 \rightarrow \frac{1}{4} - \frac{7}{4} + \frac{6}{4} \\ x=6 \rightarrow \frac{36}{4} - \frac{42}{4} + \frac{6}{4} \end{cases} \rightarrow [1, 6]$

الف) $\frac{x^2 - 3x + 2}{x - 5} < 0 \rightarrow \frac{(x-1)(x-2)}{x-5} < 0 \xrightarrow{x=1, 2, 5} \frac{1}{4} - \frac{3}{4} + \frac{2}{4}$
 $(-\infty, 1) \cup (2, 5)$ $\leftarrow$

ب) $\frac{x^2 - 1}{x^2 - 6x + 5} \geq 0 \rightarrow \frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0 \xrightarrow{x=1, -1, 5} \frac{-1}{4} - \frac{1}{4} + \frac{5}{4}$
 $(-\infty, -1] \cup (5, +\infty)$ $\leftarrow$

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

ب) $\sqrt{\frac{x^2 - 16}{x^2 - 5x + 4}} \rightarrow \frac{(x-4)(x+4)}{(x-1)(x-4)} \geq 0 \rightarrow x=1, 4, -4 \rightarrow \frac{-4}{4} - \frac{1}{4} + \frac{4}{4}$
 $D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$

الف) $y = \sqrt{4 - \sqrt{2 - x}} \rightarrow \begin{cases} 4 - \sqrt{2 - x} \geq 0 \rightarrow 2 - x \leq 16 \rightarrow x \geq -14 \\ 2 - x \geq 0 \rightarrow x \leq 2 \end{cases} \rightarrow D_f = [-14, 2]$

ب) $y = \sqrt{2 - \sqrt{x - 2}} \rightarrow \begin{cases} 2 - \sqrt{x - 2} \geq 0 \rightarrow x - 2 \leq 9 \rightarrow x \leq 11 \\ x - 2 \geq 0 \rightarrow x \geq 2 \end{cases} \rightarrow D_f = [2, 11]$

$$y = \sqrt{f - 2x^2} \rightarrow f - 2x^2 \geq 0 \rightarrow 2x^2 \leq f \rightarrow x^2 \leq \frac{f}{2} \rightarrow -\sqrt{\frac{f}{2}} \leq x \leq \sqrt{\frac{f}{2}}$$

$$D_f = [-\sqrt{\frac{f}{2}}, \sqrt{\frac{f}{2}}]$$

$$\Rightarrow y = \sqrt{3|x| - 9} \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow \begin{cases} x \geq 3 \\ x \leq -3 \end{cases} \rightarrow D_f =$$

$$(-\infty, -3] \cup [3, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{|x|+1}{|x|-2}} \rightarrow \begin{cases} |x|+1 \geq 0 \\ |x|-2 > 0 \end{cases} \rightarrow \begin{cases} |x| \geq -1 \\ |x| > 2 \end{cases} \rightarrow \begin{cases} |x| > 2 \\ |x| \neq \pm 2 \end{cases} \rightarrow x \neq \pm 2$$

$$(-\infty, -2) \cup (-2, 2) \cup (2, +\infty) \rightarrow D_f = \mathbb{R} - \{\pm 2\}$$

$$\Rightarrow y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-2}} \rightarrow \begin{cases} x \geq 0 \\ \sqrt{x}-2 > 0 \end{cases} \rightarrow \begin{cases} x \geq 0 \\ \sqrt{x} \neq 2 \end{cases} \rightarrow \begin{cases} x \geq 0 \\ x \neq 4 \end{cases} \rightarrow D_f = [0, 4) \cup (4, +\infty)$$

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

$$\text{ج) } y = \frac{\cos x}{x \sin x + 1} \rightarrow x \sin x + 1 \neq 0 \rightarrow \sin x \neq -\frac{1}{x} \rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{3\pi}{2}, 2k\pi + \frac{5\pi}{2}\}$$

$$\text{د) } y = \frac{\tan x + 2}{\cot x - 1} \rightarrow \begin{cases} \sin x \neq 0 \\ \cot x \neq 1 \end{cases} \rightarrow \begin{cases} x \neq k\pi \\ x \neq k\pi + \frac{\pi}{4} \end{cases} \rightarrow D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}\}$$

$$y = \frac{1}{\sqrt{2|x-2| - \frac{1}{x}}} \rightarrow 2|x-2| - \frac{1}{x} > 0 \rightarrow 2|x-2| > \frac{1}{x} \rightarrow |x-2| > \frac{1}{2x}$$

$$\begin{cases} x-2 > \frac{1}{2x} \rightarrow x > \frac{1}{x} \\ x-2 < -\frac{1}{2x} \rightarrow x < \frac{1}{x} \end{cases} \rightarrow D_f = (-\infty, \frac{1}{x}) \cup (\frac{1}{x}, +\infty)$$

$$\text{هـ) } y = \sqrt{f - 2|x|} \rightarrow f - 2|x| \geq 0 \rightarrow 2|x| \leq f \rightarrow |x| \leq \frac{f}{2} \rightarrow -\frac{f}{2} \leq x \leq \frac{f}{2} \rightarrow D_f = [-\frac{f}{2}, \frac{f}{2}]$$

$$\Rightarrow y = \sqrt{\frac{|x|}{|x|}} \rightarrow \frac{|x|}{|x|} \geq 0 \rightarrow \begin{cases} x \neq 0 \\ \frac{|x|}{|x|} = 1 \end{cases} \rightarrow y = 1$$

$$D_f = \mathbb{R} - \{0\} \rightarrow D_f = (-\infty, 0) \cup (0, +\infty)$$

