

برای کل محلی

«بنا بر»

تکلیف ۱) گروه دوم A دفتر

$$\text{الف) } y = \frac{x+4}{4x^3 - 2x^2 + 31x - 15}$$

$$4x^3 - 2x^2 + 31x - 15 \neq 0 \rightarrow \begin{array}{r|l} 4x^3 - 2x^2 + 31x - 15 & x-1 \\ \hline -(4x^3 - 4x^2) & 4x^2 - 14x + 15 \\ \hline 14x^2 + 31x - 15 & \textcircled{1} \\ \hline -(-14x^2 + 14x) & \\ \hline 15x - 15 & \\ \hline -(15x - 15) & \\ \hline 0 & \end{array}$$

$$4x^2 - 14x + 15 = (2x-3)(2x-5) \textcircled{2}$$

$$\rightarrow \text{مخرج: } (x-1)(2x-3)(2x-5)$$

$$\hookrightarrow x \neq \{1, 1.5, 2.5\}$$

$$\ll D_f = \mathbb{R} - \{1, 1.5, 2.5\} \gg$$

$$\text{ب) } y = \frac{x+2}{2x^3 - x^2 - 11x - 4}$$

$$2x^3 - x^2 - 11x - 4 \neq 0 \rightarrow \begin{array}{r|l} 2x^3 - x^2 - 11x - 4 & x+1 \\ \hline -(2x^3 + 2x^2) & 2x^2 - 4x - 4 \textcircled{1} \\ \hline -3x^2 - 11x - 4 & \\ \hline -(-3x^2 - 3x) & -8x - 4 \\ \hline -5x - 4 & \\ \hline -(-5x - 5) & 1 \\ \hline 1 & \end{array}$$

$$\textcircled{1} 2x^2 - 4x - 4$$

$$x_1 = 2$$

$$\Delta = 16 + 64 = 80 \rightarrow x = \frac{4 \pm \sqrt{80}}{4} \rightarrow x_2 = -\frac{2}{3}$$

$$\rightarrow x \neq \{-1, 2, -\frac{2}{3}\}$$

$$\ll D_f = \mathbb{R} - \{-1, -\frac{2}{3}, 2\} \gg$$

$$\text{الف) } y = \frac{x+1}{x - \sqrt{3-2x}}$$

$$3-2x \geq 0 \rightarrow 2x \leq 3 \rightarrow x \leq 1.5$$

$$x - \sqrt{3-2x} = 0 \rightarrow \sqrt{3-2x} = x \rightarrow 3-2x = x^2 \rightarrow$$

$$x^2 + 2x - 3 = 0 \rightarrow (x+3)(x-1) = 0 \rightarrow x = 1 \text{ / ریشه } \rightarrow \text{ ممکن است جواب نهاده.}$$

$$\ll D_f = (-\infty, 1.5] - \{1\} \gg \rightarrow x = -3 \times \rightarrow \text{ ریشه نیست / جواب می دهده.}$$

$$\text{ب) } y = \frac{x+2}{x - \sqrt{3x-2}}$$

$$3x-2 \geq 0 \Rightarrow x \geq \frac{2}{3}$$

$$x - \sqrt{3x-2} = 0 \rightarrow \sqrt{3x-2} = x \rightarrow 3x-2 = x^2 \rightarrow$$

$$x^2 - 3x + 2 = 0 \rightarrow (x-2)(x-1) = 0 \rightarrow x = 2 \text{ / ریشه}$$

$$\rightarrow x = 1 \text{ / ریشه}$$

ممكن است جواب نهاده.

$$\ll D_f = [\frac{2}{3}, +\infty) - \{1, 2\} \gg$$

$$\text{الف) } y = \frac{\sin x}{2\cos x - 1}$$

$$2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2} \rightarrow$$

$$x \neq \{2k\pi \pm \frac{\pi}{3}\} \quad D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{3}\}$$

$$\text{ب) } y = \frac{\cos x + 1}{2\sin x + 1}$$

$$2\sin x + 1 \neq 0 \rightarrow \sin x \neq -\frac{1}{2} \quad D_f = \mathbb{R} - \{2k\pi - \frac{5\pi}{6}, 2k\pi - \frac{\pi}{6}\}$$

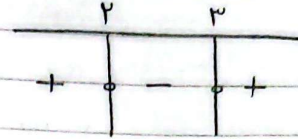
$$\text{ج) } y = \frac{\tan x + 2}{\cot x - 1}$$

$$\cot x \neq 1 \rightarrow x \neq \{k\pi + \frac{\pi}{4}\} \quad D_f = \mathbb{R} - \{\frac{k\pi}{2}, k\pi + \frac{\pi}{4}\}$$

$$2) y = \frac{\sin x + 1}{\sqrt{\sin^2 x - 3}} \quad \sqrt{\sin^2 x - 3} \rightarrow \sin^2 x \geq 3 \rightarrow \sin x \neq \pm \frac{\sqrt{3}}{2} \rightarrow x \in \left\{ 2k\pi \pm \frac{\pi}{3}, 2k\pi \pm \frac{2\pi}{3} \right\}$$

$$a) x^2 - 5x + 4 > 0 \rightarrow (x-4)(x-1) > 0$$

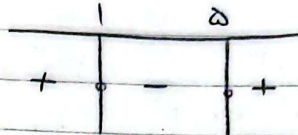
$$D_f = (-\infty, 1) \cup (4, +\infty)$$



(F)

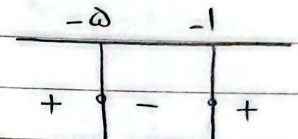
$$b) x^2 - 4x + 5 < 0 \rightarrow (x-5)(x-1) < 0$$

$$D_f = (1, 5)$$



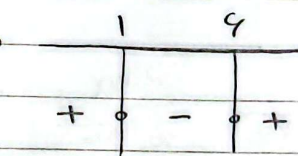
$$c) x^2 + 4x + 5 \geq 0 \rightarrow (x+5)(x+1) \geq 0$$

$$D_f = (-\infty, -5] \cup [-1, +\infty)$$



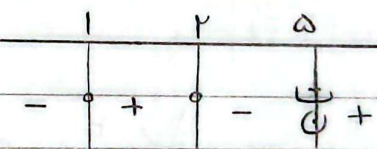
$$d) x^2 - 7x + 4 \leq 0 \rightarrow (x-9)(x-1) \leq 0$$

$$D_f = [1, 9]$$



$$a) \frac{x^2 - 3x + 2}{x-5} < 0 \rightarrow \frac{(x-2)(x-1)}{x-5} < 0$$

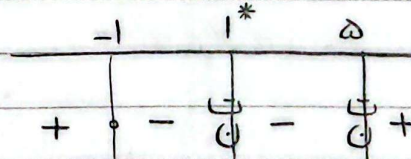
$$D_f = (-\infty, 1) \cup (2, 5)$$



(D)

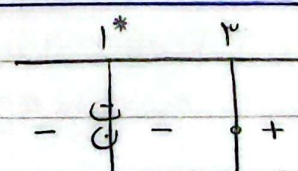
$$b) \frac{x^2 - 1}{x^2 - 4x + 5} \geq 0 \rightarrow \frac{(x-1)(x+1)}{(x-5)(x-1)} \geq 0$$

$$D_f = (-\infty, -1] \cup (5, +\infty)$$



$$a) y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}} \rightarrow \frac{(x-3)(x-1)}{x^2 - 1} \geq 0$$

$$D_f = [3, +\infty)$$

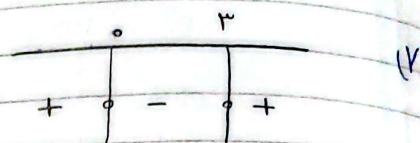


(Y)

$$b) y = \sqrt[3]{\frac{x^2 - 4x + 3}{x^2 - 1}} \quad x^2 - 1 \neq 0 \rightarrow x \neq \pm 1$$

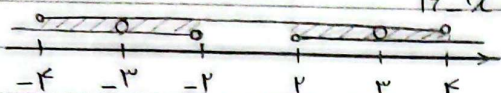
$$D_f = \mathbb{R} - \{\pm 1\}$$

الف) $y = \log(x^2 - 3x)$ $x^2 - 3x > 0 \rightarrow x(x-3) > 0$



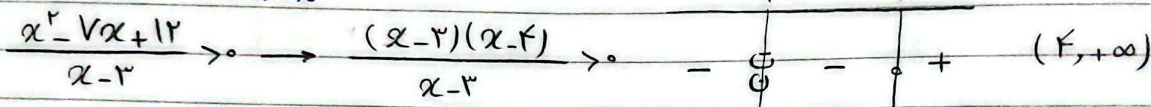
$D_f = (-\infty, 0) \cup (3, +\infty)$

ب) $y = \log \frac{16-x^2}{|x|-2}$ $|x|-2 \neq 0 \rightarrow x \neq \pm 2$ $|x|-2 > 0 \rightarrow x > 2 \text{ or } x < -2$
 $16-x^2 > 0 \rightarrow x^2 < 16 \rightarrow -4 < x < 4$



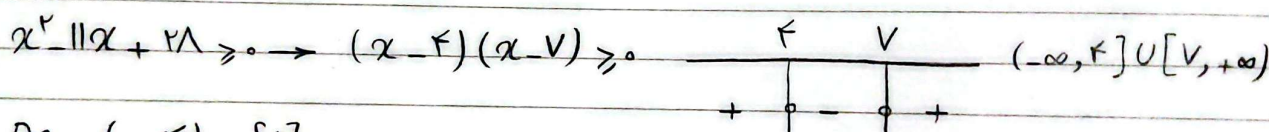
$D_f = (-4, -2) \cup (2, 4) - \{\pm 2\}$

ج) $y = \log \frac{x^2 - 7x + 12}{1-x}$ $1-x \neq 0 \rightarrow x \neq 1$ $1-x > 0 \rightarrow x < 1$



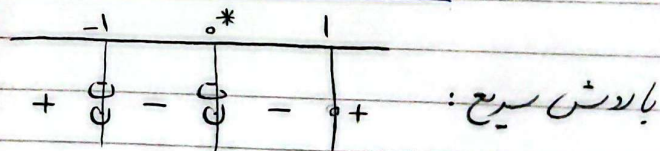
$D_f = (1, 4) - \{1\}$

د) $y = \sqrt{x^2 - 11x + 28} + \log \frac{\sqrt{36-x^2}}{x}$ $x \neq 0, x > 0$ $36-x^2 > 0 \rightarrow -6 < x < 6$



$D_f = (0, 4) - \{1\}$

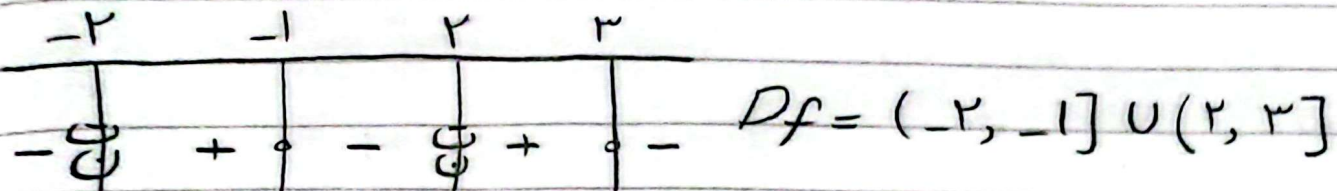
$y = \frac{x^2 - x}{x^2 + x} \rightarrow x(x-1)$
 $x^2 + x \rightarrow$ ریشه ها: $\{0, -1\}$



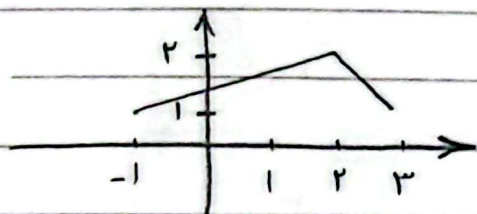
بارش آبارتانی:

	-1	0	1
$x^2 - x$	+	+	-
$x^2 + x$	+	-	+
y	+	-	+

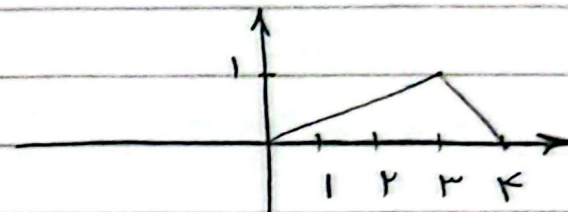
$y = \sqrt{\frac{x-f(x)}{f(x)}}$ $\frac{x-f(x)}{f(x)} > 0 \rightarrow$ ریشه ها: $x = f(x) \rightarrow x = \{-1, 3\}$
 تعیین علامت صفر بعد: $\{ \pm 2 \}$ ریشه ها: $\{ \pm 2 \}$



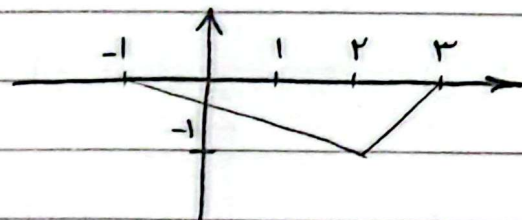
الف) $f(x)+1$



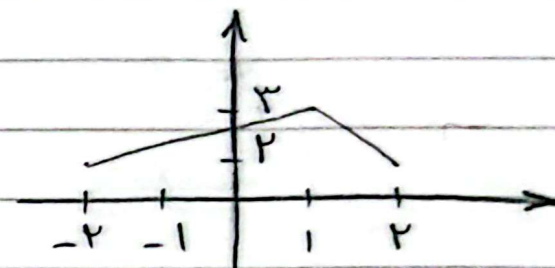
ب) $f(x-1)$



ج) $-f(x)$



د) $f(x+1)+2$



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1404, 06, 20