

برای کل محلی

«بنا»

تکلیف ۱) گروه دوم A دفتر

الف) $y = \frac{x+4}{4x^3-2x^2+31x-15}$ $4x^3-2x^2+31x-15 \neq 0 \rightarrow 4x^3-2x^2+31x-15 \mid x-1$ (۱)

$$\begin{array}{r} 4x^3-2x^2+31x-15 \\ -(4x^3-4x^2) \\ \hline 14x^2+31x-15 \\ - (14x^2+14x) \\ \hline 15x-15 \\ - (15x-15) \\ \hline 0 \end{array}$$
 ①
 $4x^3-14x+15 = (2x-2)(2x-5)$ ②
 $\rightarrow$ مخرج: $(x-1)(2x-2)(2x-5)$
 $\rightarrow x \neq \{1, 1.5, 2.5\}$
 $\ll D_f = \mathbb{R} - \{1, 1.5, 2.5\} \gg$

ب) $y = \frac{x+3}{3x^3-x^2-11x-4}$ $3x^3-x^2-11x-4 \neq 0 \rightarrow 3x^3-x^2-11x-4 \mid x+1$ ①

$$\begin{array}{r} 3x^3-x^2-11x-4 \\ -(3x^3+3x^2) \\ \hline -4x^2-11x-4 \\ - (-4x^2-4x) \\ \hline -7x-4 \\ - (-7x-7) \\ \hline 3 \end{array}$$

 $\textcircled{1} \quad 3x^3-4x-4$ $\alpha_1 = 2$
 $\Delta = 16+48 = 64 \rightarrow x = \frac{4 \pm 8}{6} \rightarrow \alpha_2 = -\frac{2}{3}$
 $\rightarrow x \neq \{-1, 2, -\frac{2}{3}\}$
 $\ll D_f = \mathbb{R} - \{-1, -\frac{2}{3}, 2\} \gg$

الف) $y = \frac{x+1}{x-\sqrt{3-2x}}$ $3-2x \geq 0 \rightarrow 2x \leq 3 \rightarrow x \leq 1.5$ ②
 $x-\sqrt{3-2x} = 0 \rightarrow \sqrt{3-2x} = x \rightarrow 3-2x = x^2 \rightarrow x^2+2x-3 = 0 \rightarrow (x+3)(x-1) = 0 \rightarrow x = 1$ / ریشه
 $\rightarrow$ ممکن است جواب نهاده
 $\rightarrow x = -3$ / ریشه نیست / جواب می دهده
 $\ll D_f = (-\infty, 1.5] - \{1\} \gg$

ب) $y = \frac{x+2}{x-\sqrt{3x-2}}$ $3x-2 \geq 0 \Rightarrow x \geq \frac{2}{3}$
 $x-\sqrt{3x-2} = 0 \rightarrow \sqrt{3x-2} = x \rightarrow 3x-2 = x^2 \rightarrow x^2-3x+2 = 0 \rightarrow (x-2)(x-1) = 0 \rightarrow x = 2$ / ریشه
 $\rightarrow$ ممکن است جواب نهاده
 $\rightarrow x = 1$ / ریشه
 $\ll D_f = [\frac{2}{3}, +\infty) - \{1, 2\} \gg$

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

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

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

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

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

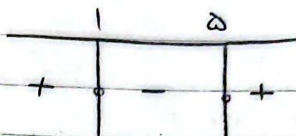
$$D_f = (-\infty, 1) \cup (4, +\infty)$$



(2) (4)

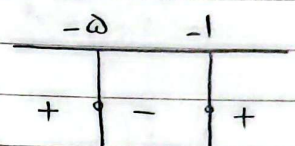
$$b) x^2 - 4x + 4 < 0 \rightarrow (x-2)(x-2) < 0$$

$$D_f = (2, 2)$$



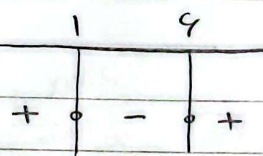
$$c) x^2 + 4x + 4 \geq 0 \rightarrow (x+2)(x+2) \geq 0$$

$$D_f = (-\infty, -2] \cup [-2, +\infty)$$



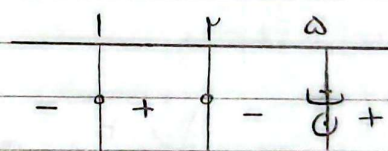
$$d) x^2 - 7x + 4 \leq 0 \rightarrow (x-4)(x-1) \leq 0$$

$$D_f = [1, 4]$$



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

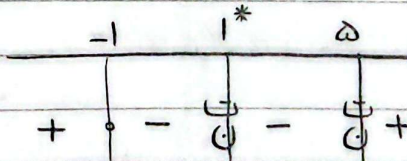
$$D_f = (-\infty, 1) \cup (2, \infty)$$



(2) (2)

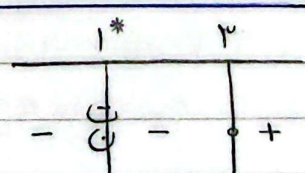
$$b) \frac{x^2 - 1}{x^2 - 4x + 4} \geq 0 \rightarrow \frac{(x-1)(x+1)}{(x-2)(x-2)} \geq 0$$

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



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

$$D_f = [1, 3] \cup (3, +\infty)$$

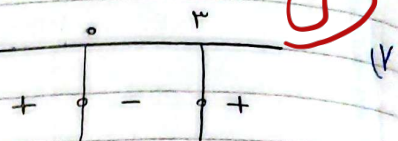


(2) (3)

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

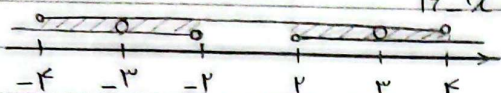
$$D_f = \mathbb{R} - \{\pm 1\}$$

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



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

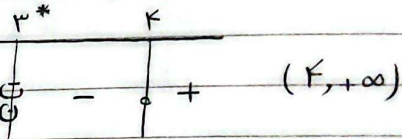
ب) $y = \log \frac{16-x^2}{|x|-2}$ $|x| \neq 2 \rightarrow x \neq \pm 2$ $|x|-2 > 0 \rightarrow x > 2 \text{ or } x < -2$
 $16-x^2 > 0 \rightarrow x^2 < 16 \rightarrow -4 < x < 4$



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

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

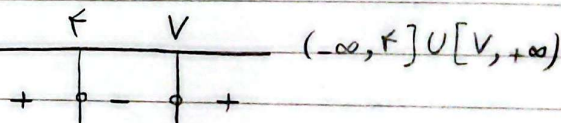
$\frac{x^2 - 7x + 12}{x-3} > 0 \rightarrow \frac{(x-3)(x-4)}{x-3} > 0$



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

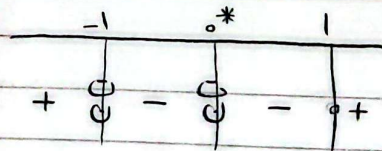
د) $y = \sqrt{x^2 - 11x + 28} + \log \frac{\sqrt{36-x^2}}{x}$ $x \neq 0, x > 0$ $36-x^2 > 0 \rightarrow -6 < x < 6$

$x^2 - 11x + 28 \geq 0 \rightarrow (x-4)(x-7) \geq 0$



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

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



باردش سیرج:

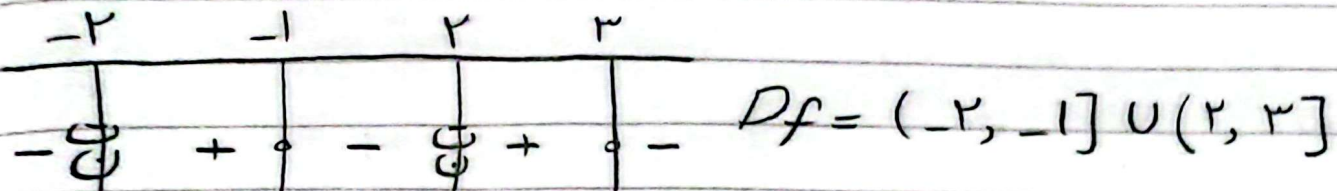
	-1	0	1
$x^2 - x$	+	+	-
$x^2 + x$	+	-	+
y	+	-	+

باردش آبارتقانی:

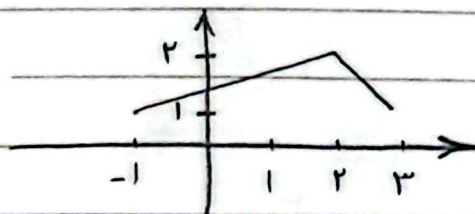
$y = \sqrt{\frac{x-f(x)}{f(x)}}$ $\frac{x-f(x)}{f(x)} \geq 0 \rightarrow$ ریشه ها: $x = f(x) \rightarrow x = \{-1, 3\}$

$\frac{x-f(x)}{f(x)} \geq 0 \rightarrow$ ریشه ها: $\{\pm 2\}$ تعیین علامت صفر بعد

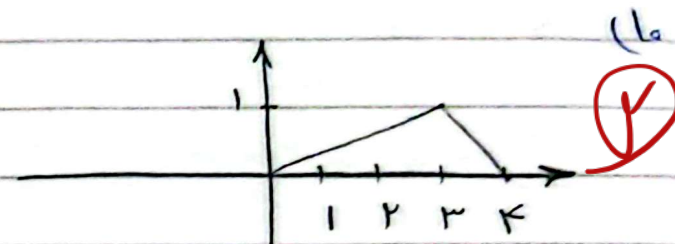
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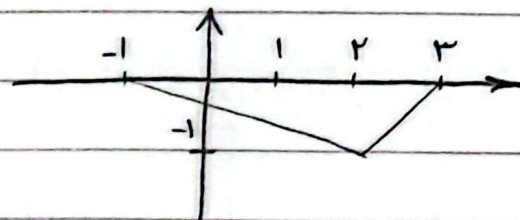
الف) $f(x)+1$



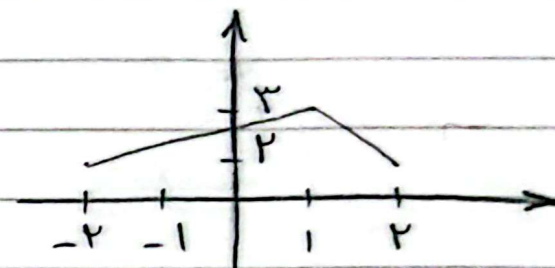
ب) $f(x-1)$



ج) $-f(x)$



د) $f(x+1)+2$



Parya Golmohammadi ;)

1404, 06, 20