

الف) $y = \frac{x+4}{4x^3 - 2x^2 + 31x - 15} \rightarrow$ جمع ضرایب صفر $\rightarrow$ تقییر بر $x-1$ $\rightarrow (x-1)(4x^2 - 14x + 15)$
 $\rightarrow (2x-3)(2x-5)$
 $x = \frac{3}{2} \rightarrow x = \frac{5}{2}$
 $D_f = \mathbb{R} - \{1, \frac{3}{2}, \frac{5}{2}\}$

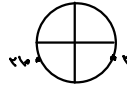
ب) $y = \frac{x+3}{3x^3 - x^2 - 18x - 4} \rightarrow$ تقییر بر $x+1$ $\rightarrow (x+1)(3x^2 - 4x - 4)$
 $\rightarrow (3x+2)(x-2)$
 $x = -\frac{2}{3} \rightarrow x = 2$
 $D_f = \mathbb{R} - \{-1, -\frac{2}{3}, 2\}$

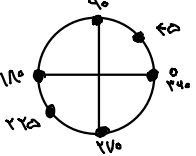
الف) $y = \frac{x+1}{x - \sqrt{3-2x}}$
 $3-2x \geq 0 \rightarrow x \leq \frac{3}{2} \rightarrow \frac{x}{\frac{3}{2}} \geq \frac{1}{\frac{3}{2}}$
 $x - \sqrt{3-2x} \neq 0 \rightarrow x \neq \sqrt{3-2x} \rightarrow x^2 \neq 3-2x \rightarrow x^2 - 2x + 3 \neq 0 \rightarrow (x-1)(x+1)$
 $x = 1 \rightarrow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

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

الف) $y = \frac{\sin x}{2\cos x - 1} \rightarrow 2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2}$

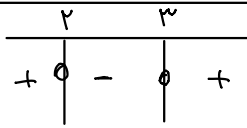
 $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}\}$

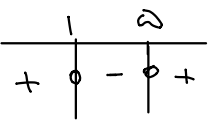
ب) $y = \frac{\cos x + 1}{2\sin x + 1} \rightarrow 2\sin x + 1 \neq 0 \rightarrow 2\sin x \neq -1 \rightarrow \sin x \neq -\frac{1}{2}$

 $D_f = \mathbb{R} - \{2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6}\}$

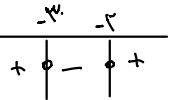
ج) $y = \frac{\tan x + 2}{\cot x - 1} \rightarrow \frac{\sin}{\cos} \rightarrow \cos \neq 0$
 $\frac{\cos}{\sin} - 1 \neq 0 \rightarrow \frac{\cos}{\sin} \neq 1 \rightarrow \cos \neq \sin$

 $D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4}\}$

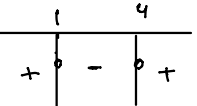
د) $y = \frac{\sin x + 1}{4\sin^2 x - 3} \rightarrow 4\sin^2 x - 3 \neq 0 \rightarrow 4\sin^2 x \neq 3 \rightarrow \sin^2 x \neq \frac{3}{4} \rightarrow \sin x \neq \pm \frac{\sqrt{3}}{2}$

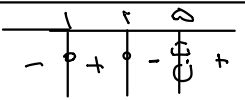
 $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{3}, k\pi + \frac{2\pi}{3}, k\pi + \frac{4\pi}{3}, k\pi + \frac{5\pi}{3}\}$

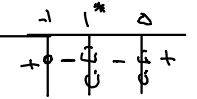
الف) $x^2 - 5x + 6 > 0 \rightarrow (x-2)(x-3) > 0$
 $x = 2 \rightarrow x = 3$

 $D_f = (-\infty, 2) \cup (3, +\infty)$

ب) $x^2 - 6x + 5 < 0 \rightarrow (x-1)(x-5) < 0$
 $x = 1 \rightarrow x = 5$

 $D_f = (1, 5)$

ج) $x^2 + 6x + 5 \geq 0 \rightarrow (x+1)(x+5) \geq 0$
 $x = -1 \rightarrow x = -5$

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

د) $x^2 - 7x + 6 \leq 0 \rightarrow (x-1)(x-6) \leq 0$
 $x = 1 \rightarrow x = 6$

 $D_f = [1, 6] \cup [6, +\infty)$

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

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

ب) $\frac{x^2 - 1}{x^2 - 6x + 5} \geq 0$
 $(x-1)(x+1) \geq 0$
 $(x-1)(x-5) \geq 0$
 $x = 1 \rightarrow x = 5$

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

الف) $y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}}$ $\lambda = 1 \rightarrow \frac{(x-1)(x-3)}{(x-1)(x+1)}$ $\lambda = 3 \rightarrow$ ریشه ندارد $Df = [3, +\infty)$

ب) $y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}}$ $\lambda = 1 \rightarrow (x-1)(x+1)$ $\lambda = -1 \rightarrow$ $Df = \mathbb{R} - \{1, -1\}$

الف) $y = \log(x^2 - 3x)$ $x^2 - 3x \neq 0$ $x(x-3) \neq 0$ $x=0 \rightarrow x=3$ $Df = (-\infty, 0) \cup (3, +\infty)$

ب) $y = \log_{\frac{1}{2}}(x^2 - 4x + 3)$ $|x| - 2 \neq 0 \rightarrow |x| \neq 2 \rightarrow |x| \neq \pm 2$ $Df = (-2, -1) \cup (1, 2) - \{+3, -3\}$

ج) $y = \log_{\frac{1}{2}} \frac{x^2 - 4x + 3}{x^2 - 1}$ $\frac{x^2 - 4x + 3}{x^2 - 1} > 0$ $\frac{(x-1)(x-3)}{(x-1)(x+1)} > 0$ $Df = (1, 3) - \{2\}$

د) $y = \sqrt{x^2 - 11x + 28} + \log_x \sqrt{49 - x^2}$ $\sqrt{49 - x^2} > 0, 49 - x^2 \geq 0 \rightarrow 7 - x \geq 0 \rightarrow 7 \geq x \rightarrow -7 < x < 7$

$y = \frac{x^2 - x}{x^2 + x} = \frac{x(x-1)}{x(x+1)}$ $x=0$ $x=-1$ $Df = (-\infty, -1) \cup (1, +\infty)$

	-1	0	1	
$x^2 - x$	+	+	-	+
$x^2 + x$	+	-	+	+
$P(x)$	+	-	-	+

$y = \sqrt{\frac{x - f(x)}{f(x)}}$ $\frac{x - f(x)}{f(x)} \geq 0$ $Df = [-2, -1] \cup (2, 3]$

	-2	-1	2	3
$x - f(x)$	-	-	+	+
$f(x)$	+	-	-	+
$P(x)$	-	+	-	+

