

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

$x^2 - 14x + 15 = 0 \rightarrow \Delta = b^2 - 4ac = 14^2 - 4 \cdot 1 \cdot 15 = 196 - 60 = 136 \rightarrow x = \frac{14 \pm \sqrt{136}}{2} \rightarrow x = 2, 15$

$IR - \{1, 15\} = D_f$

مرتبه نبول!

ب) $y = \frac{x+3}{x^3 - x^2 - 11x - 6} \rightarrow \frac{x+3}{(x+1)(x^2 - 12x - 6)}$

$\begin{cases} \frac{x}{x} = 2 \\ -\frac{3}{x} \end{cases} \rightarrow R - \{-1, 2, -\frac{3}{2}\} = D_f$

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

$(x) = (\sqrt{3-2x})^2 \rightarrow 3-2x = x^2 \rightarrow x(x+2) = 3 \rightarrow x = 1, -3$

$D_f = IR - \{1, -3\}$

$3-2x \geq 0 \rightarrow x \leq \frac{3}{2}$

ب) $y = \frac{x+2}{x - \sqrt{3x-2}}$

$(x) = (\sqrt{3x-2})^2 \rightarrow 3x-2 = x^2 \rightarrow x^2 - 3x + 2 = 0 \rightarrow (x-1)(x-2) = 0 \rightarrow \begin{cases} x=1 \\ x=2 \end{cases}$

$D_f = IR - \{1, 2\}$

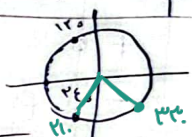
الف) $\frac{\sin x}{2 \cos x - 1} \rightarrow \frac{\cos x}{x} = \frac{1}{2} \rightarrow \cos x = \frac{1}{2} \rightarrow D_f = IR - \{2k\pi \pm \frac{\pi}{3}\}$

$D_f = IR - \{2k\pi \pm \frac{\pi}{3}\}$



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

$D_f = IR - \{2k\pi + \pi \pm \frac{\pi}{6}\}$



ج) $\frac{\tan x + 2}{\cot x - 1} \rightarrow \cot x = 1 \rightarrow D_f = IR - \{k\pi \pm \frac{\pi}{4}\}$

$D_f = IR - \{k\pi \pm \frac{\pi}{4}\}$

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

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

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

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

$D_f = (1, 5)$

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

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

د) $x^2 - 7x + 4 \leq 0 \rightarrow (x-1)(x-6) \leq 0$

$D_f = [1, 6]$

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

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

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

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

$$a) y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}} \rightarrow \frac{(x-1)(x-3)}{(x-1)(x+1)} \geq 0 \quad \begin{array}{c} -1 \quad 3 \\ \hline + \quad - \quad + \end{array} \quad D_f = [3, +\infty)$$

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

$$c) y = \log(x^2 - 3x) \rightarrow \frac{x^2 - 3x}{x(x-3)} > 0 \quad \begin{array}{c} 0 \quad 3 \\ \hline + \quad - \quad + \end{array} \quad D_f = (-\infty, 0) \cup (3, +\infty)$$

$$d) \log |x-2| > 0 \rightarrow |x-2| > 1 \rightarrow \begin{cases} x > 3 \\ x < 1 \end{cases} \quad D_f = (-\infty, 1) \cup (3, +\infty)$$

$$e) y = \log \frac{x^2 - 4x + 3}{x^2 - 1} > 0 \rightarrow \frac{(x-1)(x-3)}{(x-1)(x+1)} > 0 \rightarrow x > 3 \quad D_f = (3, +\infty)$$

$$f) y = \sqrt{x^2 - 11x + 18} + \log \frac{\sqrt{x^2 - 11x + 18}}{x} \quad \begin{cases} 1: x < 4, x \geq 5 \vee 3 < x < 4 \\ 2: -4 < x < 5 \end{cases} \rightarrow D_f = (-4, 4] - \{1\}$$

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

$x^2 - n$	+	+	0	-	0	+
$x^2 + n$	+	0	-	0	+	+
$p(x)$	+	+	-	-	0	+

شماره های مثبت

$$h) y = \sqrt{\frac{n - f(n)}{f(n)}} \rightarrow \frac{n - f(n)}{f(n)} \geq 0 \quad \begin{array}{c} -1 \quad -1 \quad 1 \quad 1 \\ \hline - \quad + \quad - \quad + \end{array} \quad D_f = (-1, -1] \cup (1, 1]$$

