

الف) $x^2 - 20x^2 + 41x - 10 = (x-1)(x^2 - 19x + 10) \neq 0$
 $\downarrow$
 $x \neq 1$

$D = R - \{1, 10, 19, 10\}$

① 1, 10

$x^2 - 19x + 10 \neq 0 \rightarrow x^2 - 19x + 19 \neq 1 \rightarrow (x-9)^2 \neq 1 \rightarrow x-9 \neq \pm 1$
 $\rightarrow x \neq \frac{10}{1}$
 $\rightarrow x \neq \frac{20}{1}$

ب) $3x^2 - x^2 - 1x - 4 = (x+1)(x^2 - 4x - 4)$

$\downarrow$
 $x \neq -1$ $(3x+2)(x-2)$

$D = R - \{-1, 2\}, -\frac{2}{3}$

از روش ریشه استفاده کنید!
 $3x^2 - 4x - 4 \neq 0 \rightarrow x^2 - 4x - 4 \neq 0 \rightarrow x^2 - 4x + 4 \neq 12 \rightarrow (x-2)^2 \neq 12 \rightarrow x-2 \neq \pm \sqrt{12} \rightarrow x \neq \frac{4}{3}$

الف) $x - \sqrt{4-2x} \neq 0 \rightarrow x \neq \sqrt{4-2x} \rightarrow x^2 \neq 4-2x \rightarrow x \neq 1$ $D = R - \{1\}$

$4-2x \geq 0$

$x \leq \frac{2}{1}$

$D_y = (-\infty, \frac{2}{1}] - \{1\}$

① 1

ب) $x - \sqrt{4x-2} \neq 0 \rightarrow x \neq \sqrt{4x-2} \rightarrow x^2 \neq 4x-2 \rightarrow x^2 - 4x + 2 \neq 0 \rightarrow (x-1)(x-2) \neq 0$
 $\downarrow$ $\downarrow$
 $x=1$ $x=2$

$4x-2 \geq 0 \rightarrow x \geq \frac{1}{2}$

$D = R - \{1, 2\}$

$D_y = [\frac{1}{2}, +\infty) - \{1, 2\}$

الف) $2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2} \rightarrow x_0, y_0$ $D_f = R - \{xk\pi \pm \frac{\pi}{3}\}$

$\frac{2\pi}{3}, \frac{\pi}{3}$

ب) $\sin x + 1 \neq 0 \rightarrow \sin x \neq -1 \rightarrow x_0, y_0$

$D_y = R - \{xk\pi + \frac{3\pi}{2}, xk\pi + \frac{5\pi}{2}\}$

$D_f = R - \{xk\pi + \pi \pm \frac{\pi}{2}\}$

ج) $\cot x - 1 \neq 0 \rightarrow \cot x \neq 1 \rightarrow x_0, y_0 \rightarrow \sin x \neq 0 \rightarrow x_0, y_0$ (II)

$\cos x \neq 0 \rightarrow x_0, y_0$ (III)

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

د) $f \sin^2 x - 3 \neq 0 \rightarrow f \sin^2 x \neq 3 \rightarrow \sin^2 x \neq \frac{3}{f} \rightarrow \sin x \neq \pm \sqrt{\frac{3}{f}} \rightarrow x_0, y_0, x_0, y_0$

$D_f = R - \{xk\pi \pm \frac{\pi}{2}\}$

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

$\frac{2}{+} - \frac{4}{+}$

$D = (-\infty, 2) \cup (4, +\infty)$

ب) $x^2 - 9x + 10 < 0 \rightarrow (x-2)(x-5) < 0$

$\frac{1}{+} - \frac{5}{+}$

$D = (2, 5)$

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

$\frac{-2}{+} - \frac{-1}{+}$

$D = R - (-2, -1)$

د) $x^2 - 7x + 12 < 0 \rightarrow (x-3)(x-4) < 0$

$\frac{1}{+} - \frac{4}{+}$

$D = [3, 4]$

الف) $\frac{x^2 - 4x + 4}{x-2} < 0 \rightarrow \frac{(x-2)(x-2)}{x-2} < 0$

$\frac{1}{-} - \frac{2}{+} - \frac{2}{+}$

$D = (-\infty, 2) \cup (2, +\infty)$

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

$\frac{-1}{+} - \frac{1}{-} - \frac{2}{+} - \frac{2}{+}$

$D = R - (-1, 2)$

$$\text{الف) } \frac{x^2 - 4x + 4}{x^2 - 1} > 0 \rightarrow \frac{(x-2)(x-1)}{(x-1)(x+1)} > 0 \rightarrow \frac{1}{x-2} > \frac{1}{x+1} \rightarrow D = [2, +\infty)$$

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$$\text{ب) } x^2 - 1 \neq 0 \rightarrow x^2 \neq 1 \rightarrow x \neq \pm 1 \quad D = \mathbb{R} - \{\pm 1\}$$

$$\text{ج) } \log x^2 + x \rightarrow x^2 - 4x > 0 \rightarrow \frac{x(x-4)}{x} > 0 \rightarrow \frac{0}{+} - \frac{4}{+} +$$

$$D \neq \mathbb{R} - [0, 4]$$

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$$\text{د) } \log \frac{4-x^2}{|x|-2} \rightarrow \begin{cases} 4-x^2 > 0 \rightarrow (2-x)(2+x) > 0 \rightarrow x = \pm 2 \\ |x|-2 > 0 \rightarrow |x| > 2 \rightarrow x > 2 \text{ or } x < -2 \\ |x|-2 \neq 0 \rightarrow |x| \neq 2 \rightarrow x \neq \pm 2 \end{cases}$$

$$\frac{-f}{+} \cdot \frac{f}{+}$$

$$D = (-2, 2) \cap (2, +\infty) \cap (-\infty, -2)$$

$$\hookrightarrow D = (-2, -1) \cup (1, 2) - \{\pm 2\}$$

$$\text{ه) } \log \frac{x^2 - 5x + 4}{x-2} \rightarrow \frac{x^2 - 5x + 4}{x-2} > 0 \rightarrow \frac{(x-4)(x-1)}{x-2} > 0 \rightarrow \frac{+}{-} \cdot \frac{+}{-} +$$

$$D = (2, +\infty) \cap (-\infty, 1) \rightarrow (2, 1) - \{1\}$$

استثناك كبر!

$$\text{و) } x^2 - 11x + 28 \rightarrow (x-4)(x-7) > 0 \rightarrow \frac{+}{+} \cdot \frac{+}{+} +$$

$$\log x \rightarrow \sqrt{4-x^2} \rightarrow \frac{\sqrt{(2-x)(2+x)}}{x} > 0 \rightarrow \frac{(2-x)(2+x)}{x} > 0 \rightarrow \frac{-}{+} \cdot \frac{+}{+} -$$

$$D_y = (0, 2] - \{1\}$$

$$D = (-4, 4]$$

$$\frac{x^2 - x}{x^2 + x} \rightarrow \frac{x(x-1)}{x(x+1)}$$

$$\frac{-1}{+} \cdot \frac{0}{-} \cdot \frac{1}{+}$$

	-1	0	1	
x	+	+	+	+
x-1	-	-	-	+
x+1	-	+	+	+
P	+	-	-	+

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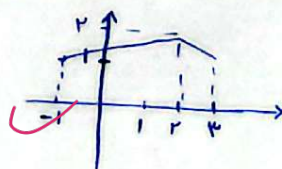
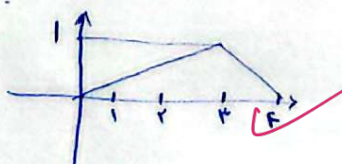
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$$\frac{x-f(x)}{f(x)} \rightarrow -1 > 0 \rightarrow x_2 - 2$$

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

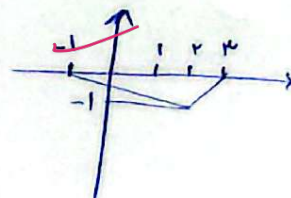
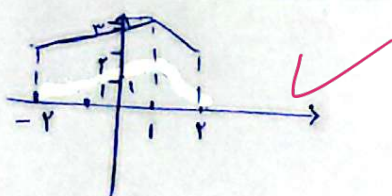
$$D = (-2, -1] \cup (2, 3]$$

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الف

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