

الف) $\frac{x+2}{x^3-2x^2+11x-14}$

$$\begin{array}{r} x^3-2x^2+11x-14 \overline{) 2x^3-4x^2+22x-28} \\ \underline{2x^3-4x^2+22x-28} \\ 0 \end{array}$$

$\frac{x-1}{x^2-14x+14} \rightarrow x^2-14x+14 \rightarrow x^2-14x+9$

$(x-1)(x-9) \leftarrow (x-1)$

$D = \mathbb{R} - \left\{ \frac{1}{9}, \frac{1}{14}, +1 \right\}$

ب) $\frac{x+2}{x^3-x^2-8x-4}$

$$\begin{array}{r} x^3-x^2-8x-4 \overline{) x^3-x^2-8x-4} \\ \underline{x^3-x^2-8x-4} \\ 0 \end{array}$$

$\frac{x+1}{x^2-5x-4} \rightarrow x^2-5x-4 \rightarrow x^2-5x-11$

$(x-4)(x+2)(x+1)$

$D = \mathbb{R} - \left\{ \frac{1}{2}, -\frac{1}{5}, -1 \right\}$

الف) $\frac{x+1}{x-\sqrt{3-4x}}$

$x-\sqrt{3-4x} \neq 0 \rightarrow x \neq \sqrt{3-4x}$

$x^2 \neq 3-4x \rightarrow 0 \neq x^2-4x+3 \rightarrow x^2-4x+3 \neq 0$

$3-4x > 0 \rightarrow \frac{3}{4} > x \rightarrow \frac{3}{4} > x \rightarrow (x-\frac{3}{4})(x+1) \neq 0$

$D = (-\infty, \frac{3}{4}] - \left\{ -\frac{3}{4}, 1 \right\}$

ب) $\frac{x+2}{x-\sqrt{4x-2}}$

$x-\sqrt{4x-2} \neq 0 \rightarrow x \neq \sqrt{4x-2} \rightarrow x^2 \neq 4x-2$

$0 \neq x^2-4x+2 \rightarrow x^2-4x+2 \neq 0$

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

$D = \left[\frac{1}{2}, +\infty \right) - \left\{ -\frac{1}{2}, \frac{1}{2} \right\}$

الف) $y = \frac{\sin x}{1-\cos x}$

$1-\cos x \neq 0 \rightarrow 1-\cos x \neq 0 \rightarrow \cos x \neq 1$

$D = \mathbb{R} - \left\{ 2k\pi \pm \frac{\pi}{2} \right\}$



Arman

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

$$D = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2} \right\}$$



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

$$\sin x \neq 0$$

$$\cos x \neq 0$$

$$D = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{2}, k\pi + \pi \right\}$$

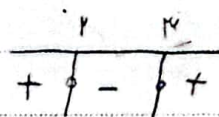


$$3) y = \frac{\sin x + 1}{\sin^2 x - 3} \rightarrow \sin^2 x - 3 \neq 0 \rightarrow \sin^2 x \neq 3 \rightarrow \sin x \neq \pm \sqrt{3}$$

$$D = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2} \right\}$$



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



(K)

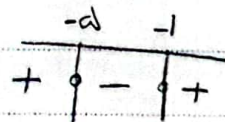
$$D = (-\infty, 2) \cup (2, +\infty)$$

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



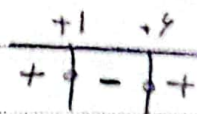
$$D = (2, 2)$$

$$6) x^2 + 4x + 4 \geq 0 \rightarrow (x+2)^2 \geq 0$$



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

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



$$D = [2, 2]$$

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



(d)

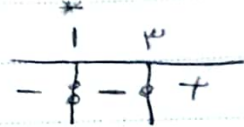
$$D = (-\infty, 1) \cup (1, a)$$

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



$$D = (-\infty, -1] \cup (a, +\infty)$$

$$10) الف) y = \sqrt{\frac{x^2 - 1x + 1}{x^2 - 1}} \rightarrow \frac{x^2 - 1x + 1}{x^2 - 1} \geq 0 \rightarrow \frac{(x-1)(x-1)}{x^2 - 1} \geq 0$$



(4)

$$D = [1, +\infty)$$

$$ب) \sqrt{\frac{x^2 - 1x + 1}{x^2 - 1}} \quad D = \mathbb{R} - \{\pm 1\}$$

$$17) الف) y = \log(x^2 - 1x) \rightarrow x^2 - 1x > 0 \rightarrow x(x-1) > 0$$

(v)

$$D = (-\infty, 0) \cup (1, +\infty)$$

$$ب) y = \log \frac{14 - x^2}{|x| - 1} \rightarrow \begin{cases} 14 - x^2 > 0 \rightarrow 14 > x^2 \rightarrow \sqrt{14} > x \\ |x| - 1 > 0 \rightarrow |x| > 1 \rightarrow -1 < x \end{cases} \rightarrow D = (-\sqrt{14}, -1) \cup (1, \sqrt{14}) - \{\pm 1\}$$

$$2) y = \log \frac{x^2 - 1x + 1}{x - 1} \rightarrow \begin{cases} \frac{x^2 - 1x + 1}{x - 1} > 0 \rightarrow \frac{(x-1)(x-1)}{(x-1)} > 0 \\ 1 - x > 0 \rightarrow 1 > x \\ 1 - x \neq 1 \rightarrow x \neq 0 \end{cases} \rightarrow D = (-\infty, 1) \cup (1, 1) - \{0\}$$

Iman

$$y = \sqrt{x^2 - 11x + 18} + \log_{\sqrt{14-x^2}} x$$

$$(x-3)(x-6)$$

$$\begin{array}{cc} 3 & 6 \\ + & - \\ - & + \end{array}$$

$$\begin{cases} 14-x^2 \geq 0 \rightarrow 14 \geq x^2 \rightarrow -\sqrt{14} \leq x \leq \sqrt{14} \\ 14-x^2 > 0 \rightarrow 14 > x^2 \rightarrow -\sqrt{14} < x < \sqrt{14} \\ x > 0 \\ x \neq 1 \end{cases}$$

$$D = (0, \sqrt{14}) - \{1\}$$

$$y = \frac{x^2 - x}{x^2 + x}$$

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

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

1

↑

$$y = \sqrt{\frac{x-f(x)}{f(x)}}$$

$$\frac{x-f(x)}{f(x)} \geq 0$$

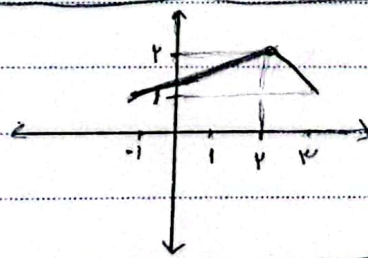
$$x-f(x) \geq 0 \rightarrow x \geq f(x) \rightarrow x \geq -1, \sqrt{14}$$

$$f(x) \geq 0 \rightarrow x \geq \frac{1}{3} - \sqrt{14}$$

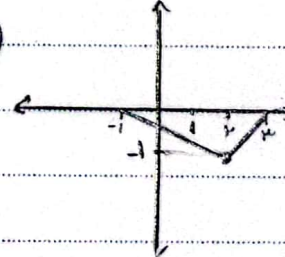
$$D = (-\infty, -1) \cup [-1, \sqrt{14}) \cup [\frac{1}{3} - \sqrt{14}, +\infty)$$

	-1	0	1	$\sqrt{14}$
$x-f(x)$	+	-	+	-
$f(x)$	+	-	+	-

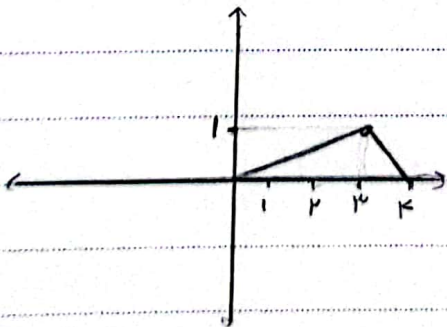
$$الف) f(x) + 1$$



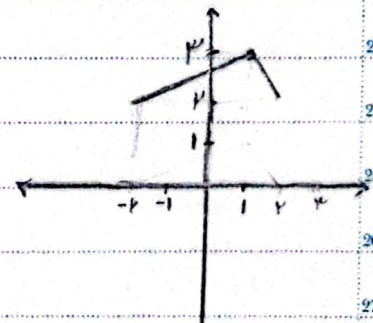
$$ب) -f(x)$$



$$ج) f(x-1)$$



$$د) f(x+1) + 1$$



Arman