

الف) $\frac{x+2}{2x^2-2x^2+11x-12}$
 $DF = R - \{1, 2, 2, 1\}$

$\frac{2x^2 - 2x^2 + 11x - 12}{-2x^2 + 2x^2}$ $\frac{x-1}{2x^2 - 11x + 12}$
 $\frac{-24x^2 + 22x}{24x^2 - 11x}$ $\rightarrow x^2 - 11x + 12 = 0$
 $\frac{10x - 12}{-11x + 12}$ $\rightarrow (x-1)(x-12) = 0$
 $\frac{1}{2} \quad \frac{1}{12} \rightarrow x=1, 12$

ب) $\frac{x+3}{2x^2-x^2-11x-4}$
 $DF = R - \{-\frac{1}{2}, 2, -1\}$

$\frac{2x^2 - x^2 - 11x - 4}{-2x^2 + x^2}$ $\frac{x+1}{2x^2 - 11x - 4}$
 $\frac{-24x^2 - 11x - 4}{-24x^2 - 11x}$ $\rightarrow x^2 - 11x - 4 = 0$
 $\frac{-11x - 4}{-11x - 4}$ $\rightarrow (x-4)(x+2) = 0$
 $\frac{1}{4} \quad \frac{1}{-2} \rightarrow x=4, -2$

الف) $y = \frac{x+1}{x-\sqrt{3-2x}}$

$\begin{cases} x - \sqrt{3-2x} \geq 0 \rightarrow x^2 - 2x + 3 \geq 0 \\ \sqrt{3-2x} \geq 0 \rightarrow 3-2x \geq 0 \rightarrow 2x \leq 3 \rightarrow x \leq \frac{3}{2} \end{cases}$
 $(x-1)(x+2) \geq 0 \rightarrow \{1, 2\}$
 $DF = [-\infty, \frac{3}{2}] - \{1, 2\}$

ب) $y = \frac{x+2}{x-\sqrt{4x-2}}$

$\begin{cases} x - \sqrt{4x-2} \geq 0 \rightarrow x^2 - 2x + 2 \geq 0 \\ \sqrt{4x-2} \geq 0 \rightarrow 4x-2 \geq 0 \rightarrow 4x \geq 2 \rightarrow x \geq \frac{1}{2} \end{cases}$
 $(x-1)(x-2) \geq 0 \rightarrow \{1, 2\}$
 $DF = [\frac{1}{2}, \infty) - \{1, 2\}$

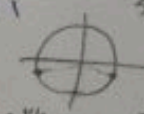
الف) $y = \frac{\sin x}{\cos x - 1}$

$\cos x - 1 \neq 0$
 $\cos x \neq \frac{1}{1}$
 $DF = R - \{k\pi + \frac{\pi}{2}, k\pi + \frac{\pi}{2}\}$



ب) $y = \frac{\cos x}{\sin x + 1}$

$\sin x + 1 \neq 0$
 $\sin x \neq -\frac{1}{1}$
 $DF = R - \{k\pi - \frac{\pi}{2}, k\pi + \frac{\pi}{2}\}$



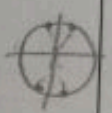
ج) $y = \frac{\tan x + 1}{\cot x - 1}$

$\begin{cases} \cos x \neq 0 \\ \cot x \neq 1 \end{cases}$



د) $y = \frac{\sin x + 1}{\sin x - 1}$

$\sin x - 1 \neq 0$
 $\sin x \neq \frac{1}{-1}$
 $DF = R - \{k\pi + \frac{\pi}{2}, k\pi + \frac{\pi}{2}\}$



الف) $x^2 - 2x + 4 > 0$
 $(x-1)(x-2) > 0$
 $DF = (-\infty, 1) \cup (2, \infty)$

ب) $x^2 - 4x + 2 < 0$
 $(x-1)(x-2) < 0$
 $DF = (1, 2)$

ج) $x^2 + 4x + 5 > 0$
 $(x+1)(x+5) > 0$
 $DF = (-\infty, -5] \cup [-1, \infty)$

د) $x^2 - 5x + 4 < 0$
 $(x-1)(x-4) < 0$
 $DF = [1, 4]$

الف) $\frac{x^2 - 3x + 2}{x-2} < 0$
 $\frac{(x-1)(x-2)}{x-2} < 0$
 $DF = (-\infty, 1) \cup (2, \infty)$

ب) $\frac{x^2 - 1}{x^2 - 4x + 4} \geq 0$
 $\frac{(x-1)(x+1)}{(x-1)(x-2)} \geq 0$
 $DF = (-\infty, -1] \cup (2, \infty)$

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

$\frac{(x-1)(x-3)}{x^2-1} \geq 0 \rightarrow \frac{1}{x-1} \geq 0 \rightarrow x > 1$

$D_f = [1, \infty)$

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

$(x^2 - 1) \neq 0 \rightarrow x \neq \pm 1 \rightarrow x \neq \pm 1$

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

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الف) $y = \log(x^2 - 3x)$

$x^2 - 3x > 0 \rightarrow x(x-3) > 0$
 $D_f = (-\infty, 0) \cup (3, \infty)$

ب) $y = \log|4 - x^2|$

$|x| < 2$
 $D_f = (-2, 2) \cup \{0\}$

$17 - x^2 > 0 \rightarrow x^2 < 17 \rightarrow -\sqrt{17} < x < \sqrt{17}$
 $|x| - 2 > 0 \rightarrow x > 2$
 $|x| > 2 \rightarrow x > 2$
 $|x| - 2 < 0 \rightarrow |x| < 2$
 $x > \sqrt{17}$

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ج) $y = \log \frac{x^2 - 2x + 1}{x - 2}$

$1 - x > 0 \rightarrow x < 1$
 $1 - x \neq 0 \rightarrow x \neq 1$
 $D_f = (-\infty, 1) - \{1\}$

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

د) $\sqrt{x^2 - 11x + 28} + \log_x \sqrt{34 - x^2}$
 $(-\infty, -2] \cup [4, \infty)$
 $D_f = (-\infty, -2] \cup [4, \infty)$

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

$\frac{-1}{x} \geq 0 \rightarrow x < 0$

$x < 0$

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

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

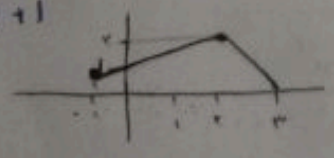
$\frac{x - f(x)}{f(x)} \geq 0 \rightarrow x = f(x) \rightarrow x = 3, -1$
 $f(x) = 0 \rightarrow x = 2, 5$

$x - f(x)$	-	-	0	+	+	0	-
$f(x)$	+	+	-	0	+	+	+
$f(x)$	+	0	+	0	-	0	-

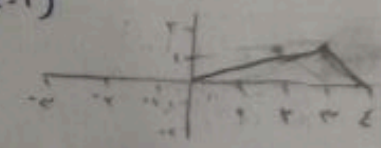
$D_f = (-1, 2) \cup (3, 5]$

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الف) $f(x) + 1$



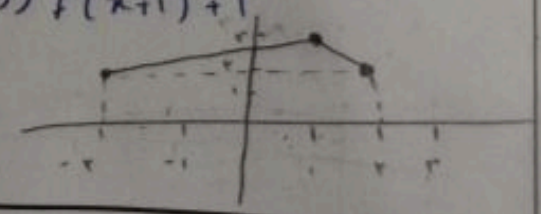
ب) $f(x-1)$



ج) $-f(x)$



د) $f(x+1) + 2$



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