

$$a) y = \frac{x+2}{x^3 - 2x^2 + 3x - 12}$$

$$x^3 - 2x^2 + 3x - 12 = 0 \Rightarrow x^2(x-2) + 3(x-4) = 0$$

سوال 1
 $\Rightarrow x=1$ (1.20)

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

$$\mathbb{R} - \{1, 0, 2, 1\}$$

$$b) y = \frac{x+3}{3x^3 - x^2 - 11x - 6}$$

$$3x^3 - x^2 - 11x - 6 \Rightarrow (3x+2)(x-3)(x+1)$$

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

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

$$3-2x \geq 0 \Rightarrow 3 \geq 2x \Rightarrow \frac{3}{2} \geq x$$

$$D_f = (-\infty, \frac{3}{2}] - \{1\}$$

سوال 2
 (1.20)

$$x^2 < 3-2x$$

$$x^2 + 2x - 3 < 0$$

$$x < -3$$

$$x < 1$$

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

$$3x-2 \geq 0 \Rightarrow 3x \geq 2 \Rightarrow x \geq \frac{2}{3}$$

$$D_f = [\frac{2}{3}, +\infty) - \{1, 2\}$$

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

$$2\cos x - 1 \neq 0 \Rightarrow \cos x \neq \frac{1}{2}$$

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

سوال 3
 (1)

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

$$2\sin x + 1 \neq 0$$

$$2\sin x \neq -1 \Rightarrow \sin x \neq -\frac{1}{2}$$

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

$$ج) y = \frac{\tan x + 2}{\cot x - 1}$$

$$\begin{cases} \tan = \frac{\sin}{\cos} \\ \cot = \frac{\cos}{\sin} \end{cases}$$

هر دو باید متوقف شوند

$$\cot x - 1 \neq 0 \Rightarrow \cot x \neq 1$$

$$\frac{\cos}{\sin} \neq 1 \Rightarrow \cos \neq \sin$$

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

$$\frac{12\pi}{4} > \frac{16\pi}{4}$$

$$د) y = \frac{\sin x + 1}{2\sin^2 x - 3}$$

$$2\sin^2 x - 3 \neq 0$$

$$2\sin^2 x \neq 3 \Rightarrow \sin^2 x \neq \frac{3}{2} \Rightarrow \sin x \neq \pm \frac{\sqrt{6}}{2}$$

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

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

$\frac{2}{+} \quad \frac{1}{-}$
 $D_f = (1, +\infty) \cup (2, -\infty)$ انكاد
(-\infty, 2)

آواتی - دهم
1

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

$\frac{1}{+} \quad \frac{2}{-}$
 $D_f = (2, +\infty) \cup (1, -\infty)$ (1, 2)

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

$\frac{-2}{+} \quad \frac{-1}{-}$
 $D_f = (-1, +\infty) \cup (-\infty, -2)$

مسکت!

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

$\frac{1}{+} \quad \frac{2}{-}$
 $D_f = (2, +\infty) \cup (1, -\infty)$ [1, 2]

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

$D_f = (1, 2) \cup (2, +\infty)$ (-1, 3) - [2]

سوال 5
1/5

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

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

ا) $y = \sqrt{\frac{x^2 - 8x + 3}{x^2 - 1}}$

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

$\frac{1}{+} \quad \frac{-3}{-}$
 $\frac{1}{+} \quad \frac{1}{+}$

$D_f = (1, -2) \cup [-3, +\infty)$
[3, +\infty)

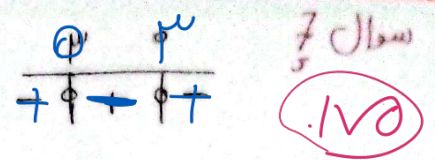
ج) $y = \sqrt{\frac{x^2 - 8x + 3}{x^2 - 1}}$

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

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

سوال 6
1

ا) $y = \log(x^2 - 3x)$ $x^2 - 3x > 0 \rightarrow x(x-3) > 0$



$D_f = (3, \infty)$

$D_y = (-\infty, 0) \cup (3, +\infty)$

ب) $y = \log \frac{14-x^2}{|x|-2}$

$14-x^2 > 0 \rightarrow 14 < x^2 \rightarrow +\sqrt{14} < x < -\sqrt{14}$
 $|x|-2 > 0 \rightarrow |x| > 2 \rightarrow x > 2, x < -2$
 $|x|-2 \neq 1 \rightarrow |x| \neq 3 \rightarrow D_f = (-\sqrt{14}, -3) \cup (3, \sqrt{14})$

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

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

$1-x > 0 \rightarrow x < 1$
 $1-x \neq 1 \rightarrow x \neq 0$

$D_f = (1, \infty)$

د) $y = \sqrt{x^2 - 11x + 12} + \log \sqrt{4-x^2}$
 $x^2 - 11x + 12 \geq 0 \rightarrow (x-3)(x-4) \geq 0 \rightarrow x \leq 3 \text{ or } x \geq 4$
 $4-x^2 \geq 0 \rightarrow -2 \leq x \leq 2$
 $x > 0$
 $x \neq 1$

$D_f = (0, 3] \cup [4, \infty)$

$D_y = [4, \infty)$

$\sqrt{(x-3)(x-4)} \geq 0 \rightarrow x \geq 4$
 $x-4 \geq 0 \rightarrow x \geq 4$
 $x-3 \geq 0 \rightarrow x \geq 3$
 $D_y = [4, \infty)$

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

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

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

①

سوال 2



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

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

$D_f = (0, +\infty)$
 $(0, \mu]$

سوال 3

سوال 3

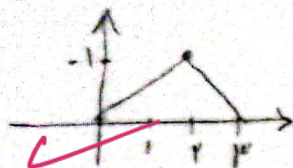
سوال 10/5

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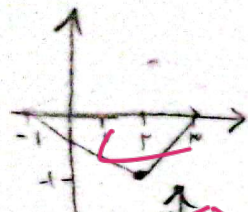
الف) $f(n)+1$



ب) $f(n-1)$



ج) $f(n)$



د) $f(n+1)+1$

