-۵

الف) $\frac{x^2-3x+2}{x-5} < 0$ $\to (x-2)(x-1)$, $x=2$, $x=1$; $\to x=5$

1	2	5
$-$ 0 $+$	0 $-$	$+$

$(-\infty\ 1] \cup [2\ \ 5)$

$\frac{x^2-1}{x^2-6x+5}$: $x^2-1 \to (x+1)(x-1)$; $x^2-6x+5 \to (x-5)(x-1)$, $x=5$, $x=1$

-1	1	5
$+$ 0 $-$	$-$	$+$

$(-\infty\ -1] \cup (5\ +\infty) + \{1\}$

-۶

ب) $\sqrt{\frac{x^2-3x+2}{x^3-1}}$ $\quad x^3-1 \neq 0 \Rightarrow x \neq 1$

$\frac{x^2-3x+2}{x^3-1} \geq 0$: $x^2-3x+2 = (x-1)(x-2)$; $x^3-1 \to (x-1)(x^2+x+1)$ $\Rightarrow \frac{(x-1)(x-2)}{(x-1)(x^2+x+1)}$, $x \neq 1$

$\frac{x-2}{x^2+x+1} \geq 0 \Rightarrow x \geq 2$ $\quad D_f = [2\ \ +\infty)$

ج) $\sqrt[3]{\frac{x^2-3x+2}{x^3-1}}$ $\quad x^3-1 \neq 0 \Rightarrow x \neq 1$

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

-۷

الف) $x^2-2x = x(x-2) > 0 \Rightarrow x > 0$ $\quad D_f = (-\infty\ 0) \cup (2\ \ \infty)$

ب) $16-x^2>0$, $|x|-2>0$, $|x|-3 \neq 0$ $\quad -4<x<4$ $\quad x>2, x<-2$, $x \neq \pm 3$ $\quad D_f = (-4,-2) \cup (2,4) - \{-3,3\}$

ج) $\left(\frac{x^2-7x+12}{x-3}\right) \to \frac{\cancel{(x-3)}(x-4)}{\cancel{(x-3)}} \to x-4>0 \Rightarrow x>4$ $\quad D_f = (4\ \ \infty)$

د) $x^2-11x+28 = (x-7)(x-4) \geq 0 \Rightarrow x \leq 4$ یا $x \geq 7$, $x>0$, $x \neq 1$; $16-x^2>0 \Rightarrow -4<x<4$ $\quad D_f = (0\ \ 1) \cup (1\ \ 4)$

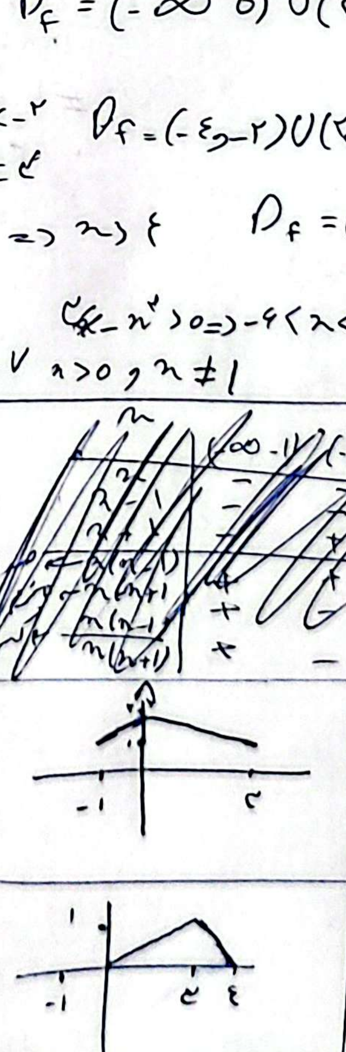
$\frac{x^2-x}{x^2+x} \to \frac{x(x-1)}{x(x+1)}$, $x \neq 0$, $x \neq -1$

	-1	0	1	
$x(x-1)$	$+$	$+$	$-$	$+$
$x(x+1)$	$+$	$-$	$+$	$+$
	$+$	$-$	$-$	$+$

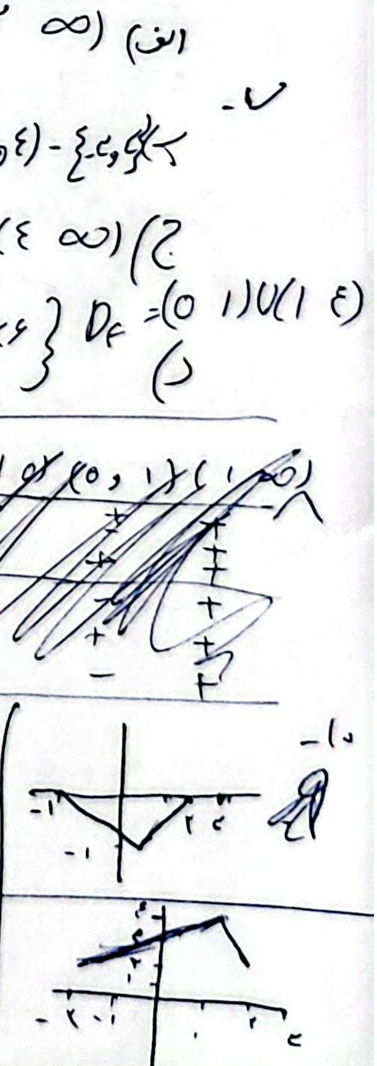
$y = \sqrt{\frac{2-f(x)}{f(x)}}$

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

-۹



-۱۰



... تکلیف ۶

۱- الف)

$\dfrac{x+4}{4x^3-20x^2+31x-15}$ → $4x^3-20x^2+31x-15=(x-1)(2x-5)(2x-3)$

$x=1$ و $x=2.5$ و $x=1.5$

$D_f=\mathbb{R}-\{1, 2.5, 1.5\}$

ب)

$\dfrac{x+3}{3x^3-x^2-8x+4}$ → $3x^3-x^2-8x-4=(x-2)(x+1)(3x+2)$

$x=2 , x=-1 , x=-\frac{2}{3}$ $\quad D_f=\mathbb{R}-\{2,-1,-\frac{2}{3}\}$

۲- الف)

$\dfrac{x+1}{x-\sqrt{3-2x}}$ → $\sqrt{3-2x}\geq 0 \to 3-2x\geq 0\to 3\geq 2x\to \frac{3}{2}\geq x$

$x-\sqrt{3-2x}\geq 0 \to x\geq\sqrt{3-2x}\to x^2\geq 3-2x\to x^2+2x\geq 3$

$x^2+2x-3\neq 0\to (x+3)(x-1)$

$\overset{\times}{x=-3}\quad \overset{\checkmark}{x=1}$ $\quad D_f=(-\infty,\frac{3}{2}]-\{1\}$

$-3-\sqrt{\cancel{3+6}}\Rightarrow -3-3=-6$

$(-\sqrt{1-2}=0)$ غیرقابل قبول

ب)

$\dfrac{x+2}{x-\sqrt{2x-3}}$ → $\sqrt{2x-3}\geq 0 \to 2x-3\geq 0\to 2x\geq 3\to x\geq\frac{3}{2}$

$x-\sqrt{2x-3}\geq 0\Rightarrow x\geq\sqrt{2x-3}\to x^2=2x-3\Rightarrow x^2-2x+3=0$

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

۳-

الف) $\dfrac{\sin x}{2\cos x-1}$

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

$x=\pm\frac{\pi}{3}+2k\pi\ (k\in\mathbb{Z})$

$\mathbb{R}-\{\pm\frac{\pi}{3}+2k\pi ; k\in\mathbb{Z}\}$

ب) $\dfrac{\cos x+1}{2\sin x+1}$

$2\sin x=-1\to\sin x=\frac{-1}{2}$

$x=-\frac{\pi}{6}+2k\pi$ یا $x=\frac{7\pi}{6}+2k\pi\ (k\in\mathbb{Z})$

$\mathbb{R}-\{-\frac{\pi}{6}+2k\pi,\frac{7\pi}{6}+2k\pi ; k\in\mathbb{Z}\}$

ج) $\cot x-1=0\Rightarrow\cot x=1$

$\tan x=1\Rightarrow x=\frac{\pi}{4}+k\pi$

$\mathbb{R}-\{k\pi,\frac{\pi}{2}+k\pi,\frac{\pi}{4}+k\pi ; k\in\mathbb{Z}\}$

د)

$x=\frac{\pi}{3}+2k\pi,\frac{2\pi}{3}+2k\pi,\frac{4\pi}{3}+2k\pi,\frac{5\pi}{3}+2k\pi$

$\mathbb{R}-\{x ; \sin x=\pm\frac{\sqrt{3}}{2}\}$

۴- الف) $x^2-5x+6>0\quad (x-3)(x-2)\quad x=3\quad x=2$ $\quad$ ۲ ۳ : + − +

ب) $x^2-6x+5\leq 0\quad (x-1)(x-5)$ $\quad$ ۱ ۵ : + − +

ج) $x^2+6x+5\geq 0\quad (x+1)(x+5)$ $\quad$ −۱ −۵ : + − +

د) $x^2-7x+6\leq 0\quad (x-1)(x-6)$ $\quad$ ۱ ۶ : + − +