Subject.

Date.

۱۵) $y = \dfrac{\sqrt{2x^2-5x+3}}{\sqrt{3x^2-7x+4}}$

$2x^2-5x+3$: roots $1 , 1.5$; $+ \;|\; - \;|\; +$ $\Rightarrow (-\infty,1] \cup [1.5,+\infty)$

$3x^2-7x+4$: roots $1 , \frac{4}{3}$; $+ \;|\; - \;|\; +$ $\Rightarrow (-\infty,1) \cup (\frac{4}{3},+\infty)$

$\Rightarrow (-\infty,1) \cup (\frac{4}{3},+\infty) \Rightarrow \boxed{D_f = (-\infty,1) \cup (\frac{4}{3},+\infty)}$

ب) $\sqrt{\dfrac{2x^2-5x+3}{3x^2-7x+4}}$

$1 \quad \frac{4}{3} \quad 1.5$; $+ \;|\; + \;|\; - \;|\; +$

$\boxed{D_f = \mathbb{R} - [\frac{4}{3}, 1.5) \cup \{1\}}$

۱۴

تکلیف دوم (۰۴/۵/۲۸) اسریسا ـ رزاق زاده

① $2x^2+y^2-4x+6y+k=0 \Rightarrow 2x^2-4x+2+y^2+6y+9-2-9+k=0$

$\Rightarrow 2(x^2-2x+1)+(y+3)^2+k-11=0$

$\Rightarrow 2(x-1)^2+(y+3)^2+k-11=0 \;,\; x+y \geqslant 11 \Rightarrow$ تابع ثابت ، $x+y<11 \Rightarrow$ تابع ثابت است

$\Rightarrow \boxed{k=11}$ ۲

② $f(x) = \begin{cases} x^2+4x & ; x \geqslant a \\ 2x+a+2 & ; x \leqslant a \end{cases}$

$(x=a) \Rightarrow f(a) = a^2+4a = 2a+a+2 \Rightarrow a^2+a-2 \Rightarrow (a+2)(a-1)=0 \Rightarrow \begin{cases} a=1 \\ a=-2 \end{cases} \rightarrow (a>0)$ ۲

$\Rightarrow f(1) = (1)^2+4(1) = 1+4 = 5 \Rightarrow \boxed{f(1)=5}$

③ $f(x) = \begin{cases} 2x^2-b & ; |x+1| \geqslant 2 \\ a+2x & : -3 \leqslant x \leqslant -1 \end{cases} \Rightarrow \begin{cases} x+1 \geqslant 2 \Rightarrow x \geqslant 1 \\ x+1 \leqslant -2 \Rightarrow x \leqslant -3 \end{cases}$ ۲

$\Rightarrow f(-3) = 2\times 9 - b = a+2(-3)$

$\Rightarrow 18-b = a-6 \Rightarrow \boxed{a+b = 6+18 = 24}$

④ $y = \sqrt{6x-a} + \sqrt{b-3x} \Rightarrow 6x \geqslant a \Rightarrow x \geqslant \frac{a}{6}$

$b \geqslant 3x \Rightarrow x \leqslant \frac{b}{3}$ ۲

$\frac{b}{3} = 2 , \frac{a}{6} = 2 \Rightarrow a=12 , b=6$

$\Rightarrow \frac{b}{a} = \frac{6}{12} = \boxed{\frac{1}{2}}$

Subject.
Date.

5 (الف) $\sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{6-x}{x^2+2x+4}} =$ ۲

$\frac{x+1}{|x-3|} \geq 0 \Rightarrow \begin{cases} x \geq 1 \\ x \neq 3 \end{cases}$ ① $\quad \frac{6-x}{x^2+2x+4} \geq 0 \begin{cases} x \leq 6 \\ x = \mathbb{R} \end{cases}$ ② $\Rightarrow$ ①,② $\Rightarrow \boxed{[-1,6] - \{3\} = D_f}$

ب) $\sqrt{[x]-4} + \sqrt{2-[x]} =$

$[x]-4 \geq 0 \Rightarrow [x] \geq 4 \Rightarrow x = [4,+\infty)$ ① $\Rightarrow$ ① $\cap$ ② $= \emptyset \Rightarrow D_f = \emptyset$

$2-[x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x = (-\infty, 3)$ ②

6 الف) $\sqrt{\frac{x^2-x-6}{x^4-13x^2+36}} \Rightarrow \frac{x^2-x-6}{x^4-13x^2+36} \geq 0$

$\Rightarrow x^2-x-6=0 \Rightarrow \Delta = 1+24 = 25 \Rightarrow x_1, x_2 = \frac{1 \pm \sqrt{25}}{2} \begin{cases} 3 * \\ -2 * \end{cases}$

$x^4-13x^2+36=0 \Rightarrow t^2-13t+36=0 \Rightarrow \Delta = 169-144 = 25 \Rightarrow t_1, t_2 = \frac{13 \pm \sqrt{25}}{2} \begin{cases} 9 \\ 4 \end{cases}$

$(t=x^2)$

$\Rightarrow t_1 = x_1^2 = 9 \Rightarrow x_1 = \pm 3$

$t_2 = x_2^2 = 4 \Rightarrow x_2 = \pm 2$

$-3 \quad -2* \quad 2 \quad 3*$

$+ \; | \; - \; | \; - \; | \; + \; | \; +$

$\Rightarrow \boxed{D_f = (-\infty, 3) \cup (2,3) \cup (3,+\infty)}$

۱

ب) $\sqrt{\frac{x^3-2x^2-5x+6}{x^3+2x^2-5x-6}} \Rightarrow \frac{x^3-2x^2-5x+6}{x^3+2x^2-5x-6} \geq 0 \Rightarrow$

$x^3-2x^2-5x+6 = (x-3)(x+1)(x-2) \Rightarrow$ ریشه‌ها $\begin{cases} 3 \\ 2* \\ -1* \end{cases}$

$x^3-2x^2-5x-6 = (x+3)(x+1)(x-2) \Rightarrow$ ریشه‌ها $\begin{cases} -3 \\ -1* \\ 2* \end{cases}$

$-3 \quad -1* \quad 2* \quad 3$

$+ \; | \; - \; | \; + \; | \; - \; | \; +$ $\Rightarrow \boxed{D_f = (-\infty, -3) \cup [3,+\infty)}$

$-3 \quad -2 \quad -1 \quad 1 \quad 2 \quad 3$

$+ \; | \; - \; | \; + \; | \; - \; | \; + \; | \; - \; | \; +$

Subject.
Date.

(7) الف) $y=\sqrt{[x]-2} \Rightarrow [x]-2 \geq 0 \Rightarrow D_f = \cancel{(-\infty,-1)}$ $(-\infty,-2]$

(1)

ب) $y=\frac{5x^2+6}{[x]^2-2[x]-3} \Rightarrow [x]^2-2[x]-3 \neq 0$

$\Rightarrow x^2-2x-3=0 \Rightarrow \Delta = 4+12=16 \Rightarrow x_1, x_2 = \frac{2\pm\sqrt{16}}{2} = \begin{cases} 3 \\ -1 \end{cases}$

$\Rightarrow [x_1], [x_2] = (4,3]$ $[3,4)$ $, (0,-1] \Rightarrow \boxed{D_f = \mathbb{R} - ([-1,0) \cup [3,4))}$ ✓

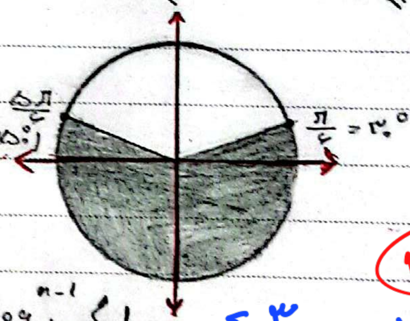
(8) $\frac{\cot x+1}{\tan x+1} \Rightarrow \tan x+1 > 0 \Rightarrow \tan x > 1 \Rightarrow \tan x \neq -1$ $\sin x, \cos x \neq 0$

$\tan(135°), \tan(315°) = -1 \Rightarrow D_f = \mathbb{R} - \{k\pi - \frac{\pi}{4}\}$ $\mathbb{R}-\{\frac{k\pi}{2}, k\pi-\frac{\pi}{4}\}$

ب) $y=\sqrt{1-4\sin^2 x} \Rightarrow 1-4\sin^2 x \geq 0 \Rightarrow 4\sin^2 x \leq 1 \Rightarrow 2\sin x \leq 1$ (0,5)

$\Rightarrow \sin x \leq \frac{1}{2} \Rightarrow D_f = \{2k\pi - \frac{5\pi}{6}\}$

$\sin x \geq -\frac{1}{2}$ $D=[k\pi-\frac{\pi}{6}, k\pi+\frac{\pi}{6}]$



(9) $\sqrt{1-\log_{\frac{1}{2}}^{x-1}} \Rightarrow$
① شرط $\Rightarrow x-1>0 \Rightarrow x>1$ ①
② شرط $\Rightarrow 1-\log_{\frac{1}{2}}^{x-1} \geq 0 \Rightarrow \log_{\frac{1}{2}}^{x-1} \leq 1$

(1,5)

$\Rightarrow x-1 \leq \frac{1}{2} \Rightarrow x \leq 1.5$ ② $\Rightarrow D_f = ① \cap ② \Rightarrow \boxed{D_f = \cancel{(1, 1.5]}}$ $[\frac{3}{2}, +\infty)$

جهت عوض ← 1 > مبنا > 0

ب) $\frac{\sqrt{x^2-x}}{1-\log_4^{x^2-3x}} \Rightarrow$
شرط اول $\Rightarrow x^2-x \geq 0$ ①
شرط دوم $x^2-3x > 0$ ②
شرط سوم $1-\log_4^{x^2-3x} \neq$ ③

① $x^2-x \geq 0$, $x^2-x=0 \Rightarrow \Delta = 1 \Rightarrow x_1, x_2 = \frac{1\pm1}{2} = \begin{cases} 0 \\ 1 \end{cases}$ $+ \; 0 \; - \; 1 \; +$ $\Rightarrow \boxed{D_f = (-\infty,0] \cup [1,+\infty)}$ ①

② $x^2-3x > 0$, $x^2-3x=0 \Rightarrow \Delta = 9+0=9 \Rightarrow x_1, x_2 =$
$\frac{3\pm\sqrt{9}}{2} = \begin{cases} 0 \\ 3 \end{cases}$ $+ \; 0 \; - \; 3 \; +$ $\Rightarrow D_f = (-\infty,0) \cup (3,+\infty)$ ②

③ $1-\log_4^{x^2-3x} \neq 0 \Rightarrow \log_4^{x^2-3x} \neq 1 \Rightarrow x^2-3x \neq 4 \Rightarrow x^2-3x-4 \neq 0 , \Delta = 9+16=25 , x_1, x_2 = \begin{cases} 4 \\ -1 \end{cases}$

$\Rightarrow D_f = \mathbb{R} - \{-1,4\} \Rightarrow ① \cap ② \cap ③ \Rightarrow D_f = ((-\infty,0) \cup (3,+\infty)) - \{4,-1\}$ ✓

Subject.

Date.

10 الف) $y=\sqrt{۴^{x-x^۲}-۸} \Rightarrow ۲^{۴x-x^۲}\geq ۸ \Rightarrow ۲^{۴x-x^۲}\geq ۲^۳ \Rightarrow ۴x-x^۲\geq ۳$

$\Rightarrow x^۲-۴x+۳\leq ۰ \Rightarrow (x-۳)(x-۱)\leq ۰ \Rightarrow$

	۱		۳	
+		−		+

$\Rightarrow \boxed{D_f=[۱,۳]}$ ✓

۲

ب) $\left(\frac{۳x+۵}{۲x+۴}\right)! \Rightarrow \frac{۳x+۵}{۲x+۴}\in W \Rightarrow ۳x+۵\in ۲Wx+۴W$

$\Rightarrow ۳x-۲Wx\in ۴W-۵ \Rightarrow x(۳-۲W)\in ۴W-۵ \Rightarrow x\in \frac{۴W-۵}{۳-۲W}$

$\Rightarrow \boxed{D_f=\left\{x \mid x=\frac{۴k-۵}{۳-۲k}, k\in W\right\}}$ ✓