رادین ملکیان   یازدهم A

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$2x^2+y^2-4x+6y+k=0 \Rightarrow 2(x^2-2x)+y^2+6y+k=0$

$2(x^2-2x)+2+y^2+6y+9=0 \Rightarrow 2(x^2-2x+1)+(y+3)^2=0 \Rightarrow 2(x-1)^2+(y+3)^2=0$

$(1,-3) \Rightarrow k=2+9=11$

۲-

$x=a \Rightarrow a^2+4a=3a+2 \Rightarrow a^2+a-2=0 \Rightarrow a=-2,1 \;,\; a>0 \Rightarrow \boxed{a=1}$

$f(1)=x^2+4x=1+4=5$

۳-

$2x^2-b \;:\; |x+1|\geq 2 \Rightarrow x+1\geq 2 \Rightarrow \boxed{x\geq 1}$

$x+1\leq -2 \Rightarrow \boxed{x\leq -3}$ if $x=-3 \Rightarrow 2x^2-b=a+2x \Rightarrow 18-b=a-6 \Rightarrow a+b=24$

۴-

$y=\sqrt{6x-a}+\sqrt{b-3x} \Rightarrow$ if $x=2 \Rightarrow \sqrt{12-a}+\sqrt{b-6}=y=0 \Rightarrow a=12 \;,\; b=6$

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

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۵) الف

$\sqrt{\frac{x+1}{|x-3|}} \Rightarrow x=-1,3$ $\quad$ (−1, 3: $-\;\;+\;\;+$) $\Rightarrow D_f=[-1,+\infty)-\{3\}$

$\sqrt{\frac{6-x}{x^2+2x+4}} \Rightarrow \sqrt{\frac{6-x}{x^2+2x+4}}$ $\quad (\Delta=4-16=-12)$ $\quad$ (6: $+\;\;-$) $\Rightarrow (-\infty,6]$

$\cap \Rightarrow [-1,3)\cup(3,6]$

ب)

$\sqrt{[x]-4} \Rightarrow [x]-4\geq 0 \Rightarrow [x]\geq 4 \Rightarrow x\geq 4$

$\sqrt{2-[x]} \Rightarrow 2-[x]\geq 0 \Rightarrow [x]\leq 2 \Rightarrow x<3$

$D_f=\varnothing$

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۶) الف

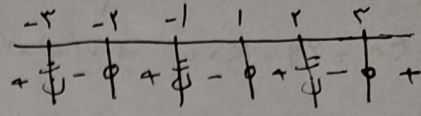
$\sqrt{\frac{x^2-x-6}{x^4-13x^2+36}} \Rightarrow \sqrt{\frac{(x-3)(x+2)}{(x-2)(x+2)(x-3)(x+3)}}$ $\quad$ (−3, −2*, 2, 3: $+\;-\;-\;-\;+\;+$)

$x^2=t \Rightarrow x^4-13x^2+36=t^2-13t+36=(t-4)(t-9)=(x-2)(x+2)(x-3)(x+3)$

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

ب)

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



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

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۱۷) الف)

$$g = \sqrt{[-x]-2} \Rightarrow [-x]-2 \geq 0 \Rightarrow [-x] \geq 2 \Rightarrow -x \geq 2 \Rightarrow x \leq -2$$

ب)

$$g = \frac{5x^2+6}{[x]^2-2[x]-3} \Rightarrow [x]^2-2[x]-3 \neq 0 \qquad \Delta = 4+12 = 16$$

$$\Rightarrow x_1 = \frac{2 \pm 4}{2} \Rightarrow [x] = -1, 3$$

$$\Rightarrow [x] \neq -1, 3 \Rightarrow D_f = \mathbb{R} - \{[3,4) \cup (\dot{0},\dot{0}]\}$$

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۱۸) الف)

$$g = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \underbrace{\tan x + 1 \neq 0}_{\tan x \neq -1 \Rightarrow 2k\pi + \frac{3\pi}{4},\ 2k\pi - \frac{\pi}{4}}, \underbrace{\cos x \neq 0}_{\frac{k\pi}{2}}, \sin x \neq 0 \Rightarrow D_f = \mathbb{R} - \left\{2k\pi + \frac{3\pi}{4},\ 2k\pi - \frac{\pi}{4},\ \frac{k\pi}{2}\right\}$$

ب)

$$g = \sqrt{1-4\sin^2 x} \Rightarrow 1-4\sin^2 x \geq 0 \Rightarrow 4\sin^2 x \leq 1 \Rightarrow \sin^2 x \leq \frac{1}{4} \Rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$$

$$D_f = \left[k\pi - \frac{\pi}{6},\ k\pi + \frac{\pi}{6}\right]$$

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۱۹) الف)

$$g = \sqrt{1-\log_{\frac{1}{2}}^{x-1}} \Rightarrow x-1 > 0 \Rightarrow x > 1, \quad 1-\log_{\frac{1}{2}}^{x-1} \geq 0 \Rightarrow \log_{\frac{1}{2}}^{x-1} \leq 1 \Rightarrow x-1 \geq \frac{1}{2}$$

$$x \geq \frac{3}{2}$$

$$D_f = \left(1, \frac{3}{2}\right]$$

ب)

$$g = \frac{\sqrt{2^x-2}}{1-\log_4^{x^2-3x}}$$

$$2^x - 2 \geq 0 \Rightarrow x(x-1) \geq 0 \quad \begin{matrix} 0 & 1 \\ + & 0 & + \end{matrix} \Rightarrow (-\infty,0] \cup [1,+\infty)$$

$$1-\log_4^{x^2-3x} \neq 0 \Rightarrow \log_4^{x^2-3x} \neq 1 \Rightarrow x^2-3x \neq 4 \Rightarrow x^2-3x-4 \neq 0$$

$$(x-4)(x+1) \neq 0$$

$$\Rightarrow x \neq 4, -1$$

$$D_f = (-\infty,0] \cup [1,+\infty) - \{4,-1\}$$

الف) $g = \sqrt{2^{4x-x^2} - 8}$ $\Rightarrow 2^{4x-x^2} - 8 \geq 0 \Rightarrow 2^{4x-x^2} \geq 8$

$\Rightarrow 4x - x^2 \geq 3 \Rightarrow -x^2 + 4x - 3 \geq 0 \Rightarrow x^2 - 4x + 3 \leq 0 \Rightarrow (x-3)(x-1) \leq 0$

	1		3	
$x-3$	−	−	0	+
$x-1$	−	0	+	+

$\Rightarrow D_f = [1, 3]$

ب) $\frac{3x+5}{2x+4} \in W \Rightarrow 3x+5 \in 2xW+4W \Rightarrow 3x-2xW \in 4W-5$

$\Rightarrow x(3-2W) \in 4W-5$

$\Rightarrow x \in \frac{4W-5}{3-2W} \Rightarrow D_f = \{x \mid x \in \frac{4K-5}{3-2K}, K \in W\}$