۱۹,۵

۱- $x^2+y^2-4x+4y+k=0 \rightarrow \square_1+\square_2=k \Rightarrow 9+2=11$

$\frac{y^2+4y+\square_1}{(y+2)^2}+\frac{2x^2-4x+2\square_2}{2(x^2-2x+\square_2)}=0$

$(x-1)^2$

(ی) ✓

۲- $a^2+4a=2a+a+2 \rightarrow a^2+a-2=0$

$(a+2)(a-1)=0 \begin{cases} a=-2 \text{ غ ق ق} \\ a=1 \text{ ق ق} \end{cases} \Rightarrow x=1 \rightarrow \underset{b}{1+4}=a$

$a=2+1+2$

(ی) ✓

۳- $|x+1| \geq 2 \rightarrow x \geq 1$

$\hookrightarrow x \leq -3 \Rightarrow x=-3 \rightsquigarrow 11-b=a-6 \rightarrow a+b=24$

(ی) ✓

۴- $x=2 \begin{cases} \rightarrow 12-a=0 \rightarrow a=12 \\ \rightarrow b-6=0 \rightarrow b=6 \end{cases} \Rightarrow \frac{b}{a}=\frac{6}{12}=\frac{1}{2}$

(ی) ✓

۵- $\frac{x+1}{\underbrace{|x-3|}_{\text{همواره مثبت}}} \geq 0 \rightarrow x \geq -1$ ، $\frac{6-x}{\underbrace{x^2+2x+4}_{\text{فاقد ریشه و دارای دلتای منفی}}} \geq 0 \rightarrow x \leq 6 \Rightarrow \cap$

$-1 \quad 6 \rightarrow D_f=[-1,6]-\{3\}$

رد ریشه مخرج

۱,۲۵

ب) $[x]-4 \geq 0$

$[x] \geq 4 \rightarrow x \geq 4$ ، $2-[x] \geq 0$

$[x] \leq 2 \rightarrow x < 3$

$\Rightarrow \cap$

$3 \quad 4 \rightarrow D_f=\emptyset$

۶- الف) $\frac{(x+2)|x-3|}{(x-2)(x-9)} \geq 0 \rightarrow$

$\frac{(x+2)(x-3)(x-3)}{(x-2)(x-9)(x-3)} \geq 0$

$-\infty \quad -3 \quad -2^* \quad 2 \quad 3^* \quad +\infty$

$+ \quad \phi \quad - \quad \phi \quad - \quad \phi \quad + \quad \phi \quad +$

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

(ی) ✓

ب) $\frac{x^4-2x^3-5x^2+6x}{x^3+2x^2-5x-6} \xrightarrow{\div x-1} \frac{x^3-x^2-6x}{x^2+3x+2} \xrightarrow{\div x+1} \frac{x(x-3)(x+2)}{(x+1)(x+2)} \geq 0$

$-\infty \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad +\infty$

$+ \quad \phi \quad - \quad \phi \quad + \quad \phi \quad - \quad \phi \quad + \quad \phi \quad - \quad \phi \quad +$

$D_f=(-\infty,-3) \cup [-2,-1) \cup [0,1) \cup [3,+\infty)$

۷-

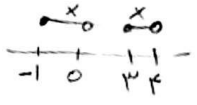
الف) $[-x]-2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow -x \geq 2$

$x \leq -2 \Rightarrow D_f=(-\infty,-2]$

(ی) ✓

ب) $[x]^2 - 2[x] - 3 \neq 0$

$([x]-3)([x]+1) \neq 0$ ⟹ $[x] \neq 3 \to \mathbb{R} - [3,4)$; $[x] \neq -1 \to \mathbb{R} - [-1,0)$

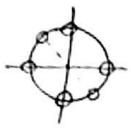


$D_f = (-\infty,-1) \cup [0,3) \cup [4,+\infty)$

۸- ب) $\cot x = \frac{\cos x}{\sin x} \to \sin x \neq 0$

$\tan x = \frac{\sin x}{\cos x} \to \cos x \neq 0$

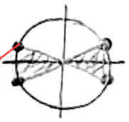
$\tan x \neq -1$



$\Rightarrow D_f = \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi + \frac{3\pi}{4} \right\}$

الف) $1 - 4\sin^2 x \geq 0 \to 4\sin^2 x \leq 1 \to -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$

$\sin^2 x \leq \frac{1}{4}$



$\Rightarrow$

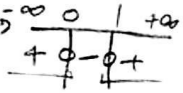
$D_f = \left[k\pi + \frac{\pi}{6}, k\pi - \frac{\pi}{6} \right]$

۹- الف) $1 - \log_{\frac{1}{2}}^{x-1} \geq 0 \to \log_{\frac{1}{2}}^{x-1} \leq 1 \to x-1 \geq \frac{1}{2}$

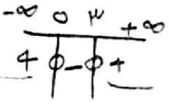
$x \leq \frac{3}{2}$ ، $x-1 > 0$ ، $x > 1$

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

ب) $x^2 - x \geq 0 \to x(x-1) \geq 0$



$x^2 - 3x > 0 \to x(x-3) > 0$

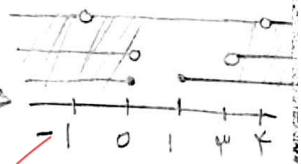


$1 - \log_4^{x^2-3x} \neq 0 \to \log_4^{x^2-3x} \neq 1 \Rightarrow x^2 - 3x \neq 4$

$x^2 - 3x - 4 \neq 0$

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

$x \neq 4, -1$

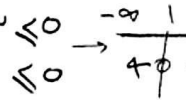


$D_f = (-\infty,-1) \cup (-1,0) \cup (3,4) \cup (4,+\infty)$

۱۰- الف) $2^{-x^2+4x} \geq 2^3 \to -x^2 + 4x \geq 3$

$x^2 - 4x + 3 \leq 0$

$(x-1)(x-3) \leq 0$



$\to D_f = [1,3]$

ب) $\frac{3x+5}{2x+4} \in \mathbb{W} \to x = -\frac{4w-5}{2w-3}$

$\Rightarrow D_f = \left\{ x \mid x = -\frac{4k-5}{2k-3}, k \in \mathbb{W} \right\}$