[پاسخنامه]

۱- $\dfrac{2x^2-4x+2}{2(x-1)^2} + \dfrac{y^2+6y+9}{(y+3)^2} \Rightarrow k = 2+9 = 11$

$1 \; . \quad \longrightarrow \; 1_{-3}$

۲- $a^2+4a = 3a+2 \Rightarrow a^2+a-2 = (a+2)(a-1) = 0 \to \boxed{a=1 \text{ ق}}$, $\; a=-2 \times$

$\Rightarrow f(x) \begin{cases} x^2+4x & x\geq 1 \\ 3x+2 & x\leq 1 \end{cases} \Rightarrow \boxed{f(1)=5} \to \begin{matrix} 1+4 \\ k \\ 3+2 \end{matrix}$

۳- $|x+1|\geq 2 \begin{cases} x+1\geq 2 \Rightarrow x\geq 1 \\ x+1\leq -2 \Rightarrow x\leq -3 \end{cases} \Big\} \to 2x^2-b$

$-3\leq x\leq -1 \Rightarrow a+2x$

$x=-3 \Rightarrow 18-b = a-6 \Rightarrow a+b=24$

۴- ۱ $\to b-3x\geq 0 \Rightarrow 3x\leq b \Rightarrow x\leq \frac{b}{3}$ $\qquad \frac{b}{3}=2 \Rightarrow \boxed{b=6}$

۲ $\to 6x-a\geq 0 \Rightarrow x\geq \frac{a}{6} \Rightarrow \frac{a}{6}=2 \Rightarrow \boxed{a=12} \Rightarrow \boxed{\frac{b}{a}=\frac{1}{2}}$

۵- الف) $x+1\geq 0 \Rightarrow x\geq -1 \Rightarrow D_f = [-1,+\infty)-\{2\}$

(الف)

$6-x\geq 0 \Rightarrow x\leq 6 \Rightarrow \boxed{D_f = [-1,6]-\{2\}}$

ب) $[x]-2\geq 0 \Rightarrow [x]\geq 2 \Rightarrow x\geq 2$

$3-[x]\geq 0 \Rightarrow [x]\leq 3 \Rightarrow x<4 \Big\} \Rightarrow D_f = [2,4)$

۶- الف) $\dfrac{(x-3)(x+2)}{(x^2-9)(x^2-4)} = \dfrac{(x-3)(x+2)}{(x-3)(x+3)(x+2)(x-2)}$

	-3		-2		2		3	
$+$		$-$		$-$		$+$		$+$

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

ب) صورت $\to (x-1)(x^2-x-6)$

$= (x-1)(x-3)(x+2)$

مخرج $\to (x+1)(x^2+x-6)$

$= (x+1)(x+3)(x-2)$

$$\Rightarrow \frac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}$$

	-3	-2	-1	1	2	3	
$+$	$-$	$+$	$-$	$+$	$-$	$+$	

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

الف) $[-x]-2 \geq 0 \Rightarrow [-x] \geq 2 \Rightarrow -x \geq 2 \Rightarrow \boxed{x \leq -2}$ -7

ب) $([x]-3)([x]+1) = 0$ $\to [x] = -1 \Rightarrow x \in [-1,0)$; $[x] = 3 \Rightarrow x \in [3,4)$

$\Rightarrow D = R - \{[-1,0) \cup [3,4)\}$

الف) $\tan\alpha \neq -1$, $\cos\alpha \neq 0$, $\sin\alpha \neq 0$ $\Rightarrow D = R - \{\frac{k\pi}{2} \cup \arctan(-1)\}$ -8

ب) $1-4\sin^2\alpha \geq 0 \Rightarrow 4\sin^2\alpha \leq 1 \Rightarrow \sin^2\alpha \leq \frac{1}{4} \Rightarrow -\frac{1}{2} \leq \sin\alpha \leq \frac{1}{2}$

$\Rightarrow D = [k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6}]$

الف) $1 - \log_{\frac{1}{2}}^{x-1} \geq 0 \Rightarrow \log_{\frac{1}{2}}^{x-1} \leq 1 \Rightarrow x-1 \geq \frac{1}{2} \Rightarrow \boxed{x \geq \frac{3}{2}}$ -9

ب) $x(x-1) \geq 0 \Rightarrow$ | 0 | 1 | : $+ \mid - \mid +$

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

$x^2-3x > 0 \Rightarrow x(x-3) > 0$ | 0 | 3 | : $+ \mid - \mid +$

$\Rightarrow D = (-\infty,0] \cup [3,+\infty) - \{-1,4\}$

-۱۰

الف)

$$2^{4x-x^2} - 8 \geq 0 \Rightarrow 2^{4x-x^2} \geq 8 \Rightarrow 4x - x^2 \geq 3$$

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

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

	1		3	
+		−		+

$$\Rightarrow D = (-\infty, 1] \cup [3, +\infty)$$

ج)

$$\frac{3x+5}{2x+4} \in W \Rightarrow \frac{3x+5}{2x+4} = k \Rightarrow x = \frac{-4k+5}{2k-3}$$

$$\Rightarrow D_f = \left\{ x = \frac{-4k+5}{2k-3} \;\middle|\; k \in W \right\}$$