

$$2x^2 + y^2 - 4x + 4y + k = 0$$

$$2x^2 - 4x + y^2 + 4y + k = 0$$

$$2(x^2 - 2x + 1 - 1) + (y^2 + 4y + 4 - 4) + k = 0$$

$$2(x-1)^2 - 2 + (y+2)^2 - 4 + k = 0$$

$$2(x-1)^2 + (y+2)^2 - 11 + k = 0 \rightarrow 2(x-1)^2 + (y+2)^2 = 11 - k \Rightarrow \boxed{k=11} \checkmark$$

(۲)

$$\underline{x=a} \rightarrow x^2 + 4x = 2x + a + 2 \xrightarrow{\text{باز کن}} a^2 + 4a = 2a + a + 2 \rightarrow a^2 + a - 2 = 0$$

$$(a+2)(a-1) = 0$$

$$\Rightarrow a = -2, 1$$

$$\xrightarrow{\text{طبق فرض}} \boxed{a=1}$$

$$\begin{cases} x^2 + 4x & : x \geq 2 \\ 2x + 4 & : x \leq 2 \end{cases} \Rightarrow f(1) = 2x + 4 = 2(1) + 4 = \boxed{6} \text{ پاسخ}$$

$$f(1) = 1 + 4 = 5$$

(۵)

$$\begin{cases} 2x^2 - b & ; |x+1| \geq 2 \\ a + 2x & ; -3 \leq x \leq 1 \end{cases} \rightarrow \begin{cases} x+1 \geq 2 \rightarrow \boxed{x \geq 1} \\ x+1 \leq -2 \rightarrow \boxed{x \leq -3} \end{cases}$$

مشتق

$$\xrightarrow{\text{بسم ازای}} \xrightarrow{x=-3} a - 4 = 11 - b \rightarrow \boxed{a+b=11+4=15} \checkmark$$

همه را بزنند

(۲)

$$y = \sqrt{4x-a} + \sqrt{b-3x} \rightarrow D_f = \{2\}$$

$$\left(\begin{cases} 4x \geq a \xrightarrow{\text{باز کن}} \boxed{a \leq 12} \\ b \geq 3x \rightarrow \boxed{b \geq 6} \end{cases} \right)$$

$$\Rightarrow \text{همین دامنه مقادیر جواب دارد} \Rightarrow \begin{cases} a=12 \\ b=6 \end{cases} \rightarrow \boxed{\frac{b}{a} = \frac{6}{12} = \frac{1}{2}} \checkmark$$

(۲)

$$\begin{aligned} & \frac{x+1}{|x+1|} > 0 \Rightarrow [-1, +\infty) - \{3\} \\ & \frac{4-x}{x^2+2x+4} > 0 \Rightarrow \boxed{x \leq 4} - \{3\} \end{aligned}$$

{3} - همواره مثبت

استثنا

$$\boxed{[-1, 4] - \{3\}}$$

✓

$$\begin{aligned} \text{ب) } [x] - 4 > 0 & \rightarrow [x] > 4 \\ & \hookrightarrow [4, +\infty) \end{aligned}$$

$$\begin{aligned} 2 - [x] > 0 & \rightarrow [x] < 2 \\ & \hookrightarrow (-\infty, 2) \end{aligned}$$

$$\rightarrow D_f = \emptyset \text{ این دو استرژ آرد ندارند} \checkmark$$

(۲)

۵

$$\frac{(x-3)(x+2)}{(x^2-9)(x^2-4)}$$

$\begin{matrix} \text{---} & \text{---} & \text{---} & \text{---} \\ \text{---} & \text{---} & \text{---} & \text{---} \end{matrix}$

$$\frac{x}{x^2-9} - \frac{2}{x^2-4} + \frac{1}{x^2-9} + \frac{1}{x^2-4}$$

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

$$\Rightarrow \frac{(x^2-x-6)(x-1)}{(x^2+x-6)(x+1)} \rightarrow \frac{(x-3)(x+2)(x-1)}{(x+3)(x-2)(x+1)}$$

$$\frac{x}{x^2-9} - \frac{2}{x^2-4} + \frac{1}{x^2-9} + \frac{1}{x^2-4}$$

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

$$\hookrightarrow D_f \checkmark$$

$$\text{الف) } [-x] - 2 > 0$$

$$[-x] > 2 \quad (-\infty, -2]$$

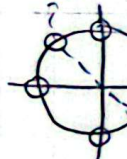
$$D_f = (-\infty, -1)$$

$$\Rightarrow \frac{dx^2+4}{[x^2]-2[x]-3}$$

$$([x]-3)([x]+1) \neq 0$$

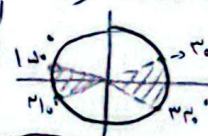
$$D_f = \mathbb{R} - \{[3, 4) \cup [-1, 0)\} \checkmark$$

$$\text{الف) } \frac{\cot x + 1}{\tan x + 1} \rightarrow \begin{cases} \sin \neq 0 \\ \cos \neq 0 \\ \tan \neq -1 \end{cases}$$



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

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



$$-\frac{1}{2} \leq \sin x \leq \frac{1}{2}$$

$$\hookrightarrow [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}] \cup [2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6}]$$

$$\text{الف) } 1 - \log_{\frac{1}{4}} x > 0$$

$$\log_{\frac{1}{4}} x \leq 1$$

$$x-1 > \frac{1}{4} \rightarrow x > \frac{5}{4} \checkmark$$

$$x-1 > 0 \rightarrow x > 1$$

$$\Rightarrow x^2 - x > 0 \rightarrow x(x-1) > 0$$

$$1 - \log_{\frac{1}{4}} x \neq 0 \rightarrow \frac{x-3}{x} > 0 \rightarrow x(x-3) > 0$$

$$\log_{\frac{1}{4}} x \neq 1 \rightarrow \log_{\frac{1}{4}} x \neq \frac{1}{2} \rightarrow x \neq \frac{1}{2} \rightarrow (x-1)(x+1) \neq 0$$

$$D_f = (-\infty, -1) \cup (-1, 0) \cup (3, 4) \cup (4, +\infty) \hookrightarrow x \neq \{-1, 4\} \checkmark$$

$$\frac{-x^2+5x}{x^2+5x+3} > 1 \Rightarrow -x^2+5x > x^2+5x+3$$

$$x^2+5x+3 > 0 \quad -x^2+5x-3 > 0$$

$$(x+3)(x+1) > 0 \Rightarrow x < -3 \text{ or } x < -1$$

$$\frac{x}{x^2-4} + \frac{3}{x^2-9} \rightarrow D_f = [1, 3] \checkmark$$

$$\frac{2x+d}{2x+f} \in W, \frac{d-f-b}{d-f-a} \text{ ليس } \frac{+fW-d}{2W-f}$$

$$\Rightarrow \frac{fW-d}{2-fW} \in X$$

$$\Rightarrow D_f = \left\{ x \mid x = \frac{fk-d}{2-fk}, k \in W \right\} \checkmark$$