

الف) $x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow (-\infty, -1] \cup [1, +\infty)$
 $x - 2 \geq 0 \rightarrow x \geq 2 \rightarrow [2, +\infty)$

$\Rightarrow D_f = [2, +\infty)$

ب) $2 - 3x \geq 0 \rightarrow 2x \leq 2 \rightarrow x \leq 1$
 $4x - 2 > 0 \rightarrow 4x > 2 \rightarrow x > \frac{1}{2}$

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

1, 5, 6

$\sqrt{12-a} + \sqrt{b-6} = 0$
 $\downarrow \quad \downarrow$
 $12-a=0 \quad b-6=0$
 $a=12 \quad b=6$

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

راه حل سوال ها در صفحه های آخر نوشته شد

در محاسبه های دامنه بنایید ساده نکنی !!!

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

$\frac{1}{(x+3)(x-2)} \geq 0 \rightarrow \frac{x}{y} + \frac{-3}{3} - \frac{2}{2} + \frac{2}{2} \rightarrow D_f = (-\infty, -3) \cup (2, +\infty)$

1, 2, 8

ب) $y = \sqrt{\frac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}} \geq 0 \rightarrow \frac{x}{y} + \frac{-3}{3} - \frac{2}{2} + \frac{1}{1} - \frac{1}{1} + \frac{2}{2} - \frac{3}{3} + \frac{2}{2} \rightarrow D_f = (-\infty, -3) \cup [-2, -1) \cup [2, 2) \cup [3, +\infty)$

الف) $y = \sqrt{x[x]-4} \rightarrow x[x]-4 \geq 0 \rightarrow x[x] \geq 4 \rightarrow [x] \geq \frac{4}{x} \rightarrow [x] \geq 2 \rightarrow D_f = [2, +\infty)$

9

ب) $y = \sqrt{x[x]-5} \rightarrow x[x]-5 \geq 0 \rightarrow x[x] \geq 5 \rightarrow [x] \geq \frac{5}{x} \rightarrow [x] \geq 3 \rightarrow D_f = [3, +\infty)$

الف) $\frac{x+1}{|x-3|} \geq 0 \rightarrow \frac{x}{y} + \frac{-1}{1} - \frac{3}{3} + \frac{3}{3} \rightarrow (-\infty, -1] \cup (3, +\infty) \Rightarrow D_f = (-\infty, -1] \cup (3, 4]$

$\frac{4-x}{x^2+x+4} \geq 0 \rightarrow \frac{x}{y} + \frac{4}{4} - \frac{1}{1} - \frac{1}{1} \rightarrow (-\infty, 4]$

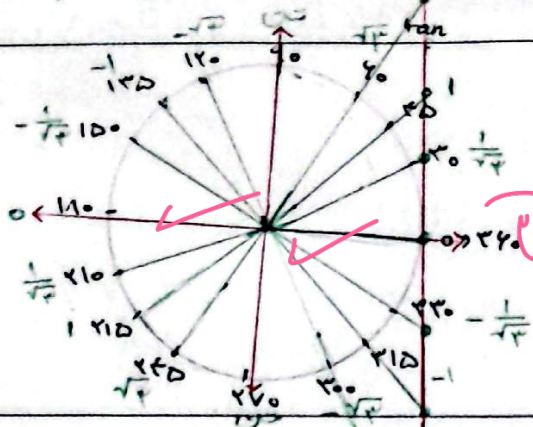
ب) $[x]-4 \geq 0 \rightarrow [x] \geq 4 \rightarrow [4, +\infty)$

$2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow (-\infty, 2)$

$\Rightarrow D_f = \emptyset$

1, 8

10



ا) $\frac{1}{\sqrt{3}} + (-1) + (2 \times 1) = \frac{5}{\sqrt{3}}$
 ب) $-(-\frac{\sqrt{3}}{2}) + (\frac{\sqrt{3}}{2}) - (2 \times -\frac{\sqrt{3}}{2}) = \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} + \sqrt{3} = \frac{5\sqrt{3}}{2}$
 ج) $-\frac{\sqrt{3}}{2} + (\sqrt{3}) - (2 \times -\frac{\sqrt{3}}{2}) = \frac{\sqrt{3}}{2} + \sqrt{3} + \sqrt{3} = \frac{5\sqrt{3}}{2}$
 د) $\cos 0^\circ + \sin(\frac{\pi}{2}) = 1 + 1 = 2$

$a^2 + 4a = 2a + a + 2$
 $a^2 + a - 2 = 0 \rightarrow \boxed{a=1}$
 $a = -2$ (غیر قابل قبول)
 $f(1) = 1 + 4 = 5$

$|x+1| \geq 2 \rightarrow \begin{cases} x+1 \geq 2 \rightarrow x \geq 1 \\ x+1 \leq -2 \rightarrow \boxed{x \leq -3} \end{cases}$
 $\boxed{-3 \leq x \leq -1}$
 $x = -2 \rightarrow \begin{cases} 1 \cdot b = a - 2 \\ \boxed{a+b = 24} \end{cases}$

ا) $x^2 - 4x^2 \neq 0 \rightarrow x^2(x-4) \neq 0 \rightarrow \begin{cases} x \neq 0 \\ x \neq 4 \end{cases} \rightarrow D_f = \mathbb{R} - \{0, 4\}$

ب) $2x^2 + 2x + 4x^2 + 4 \neq 0 \rightarrow 2x(x^2+1) + 4(x^2+1) \neq 0 \rightarrow (2x+4)(x^2+1) \neq 0$
 $D_f = \mathbb{R} - \{-2\}$
 $x^2 \neq -1$
 $\boxed{x \neq -2}$

الف-٩) $y = \sqrt{x^2 - 1} + \sqrt{x - 2}$

عبارت زیر را ریکال باید ناقصی باشد

$$x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \leadsto x \geq 1 \text{ و } x \leq -1$$

$$x - 2 \geq 0 \rightarrow x \geq 2$$

$$\leadsto x \geq 2 \leadsto \text{Def} = [2, +\infty)$$

الف-٨) $y = \sqrt{\frac{x^2 - x - 4}{x^4 - 13x^2 + 34}} \leadsto \frac{x^2 - x - 4}{x^4 - 13x^2 + 34} \geq 0 \leadsto \frac{(x-3)(x+2)}{(x^2-9)(x^2-4)} \geq 0$

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

$$\text{Def} = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$$

الف-١٠) $y = \sqrt{\frac{x+1}{|x-4|}} + \sqrt{\frac{4-x}{x^2+2x+2}}$

$\begin{cases} \frac{x+1}{|x-4|} \geq 0 \rightarrow x \geq -1, x \neq 4 \text{ I} \\ \frac{4-x}{x^2+2x+2} \geq 0 \rightarrow x \leq 4 \text{ II} \end{cases}$

$\Delta < 0$ و محاوره مثبت و بدون مقرونیت
 $\Delta < 0$ فقط مقرونیت مفرد!

$$\xrightarrow{\text{I} \cap \text{II}} \text{Def} = [-1, 3) \cup (3, 4] \subseteq [-1, 4] - \{4\}$$