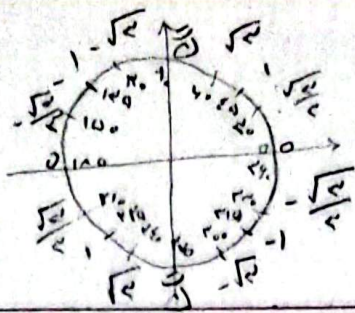




(1)

$$\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{3\pi}{4} = \frac{1}{2} + (-1) + (-2) = -\frac{3}{2} \quad (الف)$$

$$-\cos \frac{5\pi}{4} + \sin \frac{3\pi}{4} - 2 \sin \frac{5\pi}{4} = \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} + \frac{2\sqrt{2}}{2} = \frac{2\sqrt{2}}{2} \quad (ب)$$

$$\cot \frac{3\pi}{4} + 2 \cot \frac{5\pi}{4} - 2 \tan \frac{5\pi}{4} = -\frac{\sqrt{2}}{2} + \frac{2\sqrt{2}}{2} + \frac{2\sqrt{2}}{2} = \frac{4\sqrt{2}}{2} \quad (ج)$$

$$\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{4}) = \cos(0) + \sin \frac{\pi}{4} = 1 + 1 = 2 \quad (د)$$

$$f(a) = a^2 + 4a = 2a + a + 2 \Rightarrow a^2 + a - 2 = 0 \Rightarrow (a-1)(a+2) = 0 \quad (ه)$$

$$\underline{a > 0} \Rightarrow a = 1 \Rightarrow f(1) = 1^2 + 4 \times 1 = 1 + 4 = 5$$

$$|x+1| \geq 2 \Rightarrow -2 \geq x \geq 1 \quad (و)$$

$$f(-2) = 1a - b = a - 6 \Rightarrow 1a + 6 - b - a = 1a + 6 - (a+b) = 0 \Rightarrow a+b = 12$$

$$x^2 - 4x^2 \neq 0 \Rightarrow x^2(x-4) \neq 0 \Rightarrow x \neq 0 \text{ و } 4 \Rightarrow D_f = \mathbb{R} - \{0, 4\} \quad (ز)$$

ب) با بسازداری یکی از اینها 2- است

$$\frac{2x^2 + 4x^2 + 2x + 4}{x+2} = 2x^2 + 2 \Rightarrow \text{بقی است}$$

$$D_f = \mathbb{R} - \{-2\}$$

$$\sqrt{x-1} \rightarrow D_f = (-\infty, 1] \cup [1, +\infty) \quad \sqrt{x-2} \rightarrow D_f = [2, +\infty) \Rightarrow D_{f \cdot g} = [2, +\infty) \quad (ح)$$

$$4 - 2x \geq 0 \Rightarrow x \leq 2 \quad 4x - 2 > 0 \Rightarrow x > \frac{1}{2} \Rightarrow D_f = (\frac{1}{2}, 2] \quad (ط)$$

(ث) فقط در  $y=0$  با هم برابرند و چون زیر یک کمال صافی نمی شود هر دو باید 0 باشند

$$f(x) = \sqrt{12-a} + \sqrt{b-6} \Rightarrow a=12 \text{ و } b=6 \Rightarrow \frac{b}{a} = \frac{6}{12} = \frac{1}{2}$$

$$x^2 - x - 6 = (x-3)(x+2) \Rightarrow x = 3 \text{ و } -2 \quad (1)$$

$$x^2 = t \Rightarrow x^2 - 14x^2 + 46 = t^2 - 14t + 46 = (t-4)(t-9) \Rightarrow x^2 = 4 \text{ و } 9 \Rightarrow x = \pm 2, \pm 3$$

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

ب) در صورت جمع ضرایب صفر است و در مخرج جمع ضرایب یکی در میان است

$$\frac{x^2 - 2x^2 - 4x + 6}{x^2 + 2x^2 - 4x - 6} = \frac{(x-1)(x^2 - x - 6)}{(x+1)(x^2 + x - 6)} = \frac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}$$

$$\frac{-2}{+3} - \frac{-2}{+3} - \frac{1}{+3} + \frac{1}{+3} + \frac{2}{+3} - \frac{2}{+3} \Rightarrow D_f = (-\infty, -2) \cup (-2, -1) \cup [1, 2) \cup [2, +\infty)$$

$$2[n] - \varepsilon \geq 0 \Rightarrow 2[n] \geq \varepsilon \Rightarrow [n] \geq \frac{\varepsilon}{2} \Rightarrow \boxed{n \geq 2}$$

(9) الف

$$2[n] - \omega \geq 0 \Rightarrow 2[n] \geq \omega \Rightarrow [n] \geq \frac{\omega}{2} \Rightarrow n \geq 2$$

(ب)

$$\left. \begin{array}{l} \sqrt{\frac{n+1}{|n-2|}} \rightarrow n \geq -1 \\ \sqrt{\frac{n+1}{|n-2|}} \rightarrow n \neq 2 \end{array} \right\} \Rightarrow D_f = [-1, +\infty) - \{2\}$$

(10) الف

شماره مثبت  
در نقطه ۳  
مساوی با صفر

$$\left. \begin{array}{l} \sqrt{\frac{4-n}{n^2+2n+4}} \rightarrow n \leq 4 \\ \sqrt{\frac{4-n}{n^2+2n+4}} \rightarrow \text{ریشه ندارد و همیشه مثبت است} \end{array} \right\} \Rightarrow D_f = (-\infty, 4]$$

$$D_{f \text{ کلی}} = [-1, +\infty) - \{2\} \cap (-\infty, 4]$$

$$\boxed{[-1, 4] - \{2\}}$$

(ب)

$$\left. \begin{array}{l} \sqrt{[n] - \varepsilon} \Rightarrow n \geq \varepsilon \\ \sqrt{2 - [n]} \Rightarrow n < 2 \end{array} \right\} \Rightarrow D_f = [\varepsilon, +\infty) \cap (-\infty, 2) = \emptyset$$