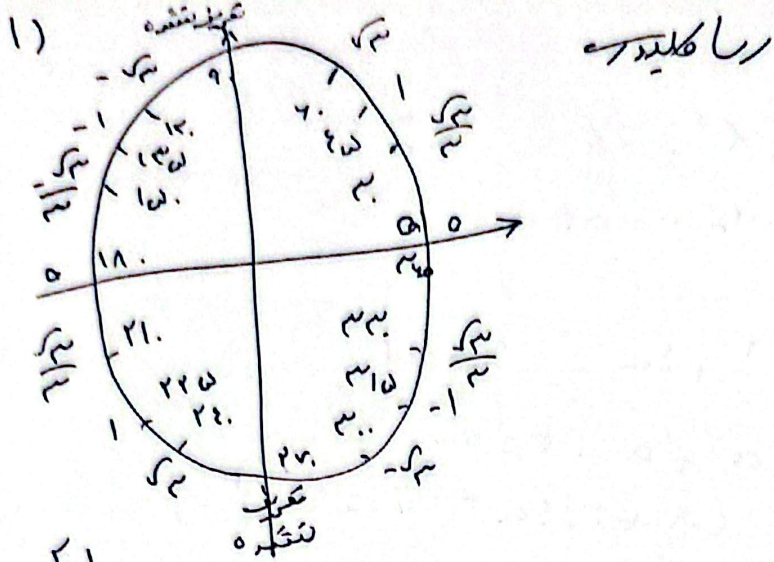




٢) الف $\sin \frac{\pi}{6} + \cos \pi + \tan \frac{3\pi}{4} =$

$$\frac{1}{2} + 0(-1) - 1 = -\frac{1}{2}$$

ب) $-\cos \frac{5\pi}{6} + \sin \frac{2\pi}{3} - 3 \sin \frac{\pi}{6} =$

$$\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - 3 \left(\frac{1}{2} \right) = \frac{\sqrt{3}}{2}$$

ج) $\cos \frac{\pi}{6} + 2 \cos \frac{\pi}{3} - 2 \tan \frac{5\pi}{6} =$

$$\frac{\sqrt{3}}{2} + \frac{2\sqrt{3}}{2} - 2 \left(-\frac{1}{\sqrt{3}} \right) = \frac{3\sqrt{3}}{2} + \frac{2}{\sqrt{3}}$$

د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{6}) =$

$$\cos(0) + \sin(\pi) = 1 + 0 = 1$$

2)

$$f(x) = \begin{cases} x^r + \varepsilon x & x \geq a \\ rx + a + r & x \leq a \end{cases}$$

$$x = a \rightarrow a^r + \varepsilon a = ra + r$$

$$a^r + a - r = 0$$

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

$$\begin{cases} a = 1 \quad \checkmark \leftarrow \text{a.p.} \\ a = -r \end{cases}$$

$$f(1) = 1 + \varepsilon \quad \text{ⓐ}$$

$$3) \quad f(x) = \begin{cases} rx^r - b & |x+1| \geq r \\ a + rx & -r \leq x \leq -1 \end{cases}$$

$$x = -r \rightarrow$$

$$1 - b = a - r$$

$$r\varepsilon = a + b \quad \text{ⓑ}$$

4)

الف)

$$y = \frac{1}{x^r - \varepsilon x^r}$$

$$x^r - \varepsilon x^r \neq 0$$

$$x^r(x - \varepsilon) \neq 0$$

$$x \neq 0$$

$$x \neq \varepsilon$$

$$D_f = \mathbb{R} - \{0, \varepsilon\}$$

$$\frac{1}{x^r + \varepsilon x^r + rx + r} \rightarrow$$

$$x^r + \varepsilon x^r + rx + r \neq 0$$

$$D = \mathbb{R} - \{-r\}$$

$$x^r + rx + r \neq 0$$

$$(x+r)(x+1) \neq 0$$

$$x(x^r+1) + r(x^r+1) \neq 0 \rightarrow$$

$$x \neq -r$$

7)

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

$$x^2 - 1 \geq 0$$

$$(x - 1)(x + 1) \geq 0$$

$$\frac{-1}{+0} - \frac{1}{-0} + \textcircled{1}$$

$$x - 2 \geq 0$$

$$x \geq 2 \textcircled{2}$$

$$\Rightarrow \textcircled{1} \cap \textcircled{2} \Rightarrow x \geq 2$$

✓ 1

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

همرد وادیکال
برای صفری شود
چون مثبت داشته است

$$\Rightarrow 4 - a = 0$$

$$a = 4$$

$$b - 2 = 0$$

$$b = 2$$

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

Λ)

$$y = \sqrt{\frac{x^2 - x - 6}{x^2 - 12x + 36}}$$

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

$$= \sqrt{\frac{(x - 3)(x + 2)}{(x - 2)(x + 2)(x - 3)(x + 3)}}$$

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

ب

$$y = \sqrt{\frac{x^3 - 2x^2 - 5x + 6}{x^3 + 2x^2 - 5x - 6}}$$

یکی از ریشه ها $\Rightarrow$ جمع ضرایب فرد $\rightarrow$ جمع ضرایب صفر

$$\begin{array}{r} x^3 - 2x^2 - 5x + 6 \\ - (x^3 - x^2) \\ \hline -x^2 - 5x + 6 \\ + (x^2 + 2x - 6) \\ \hline -3x + 0 \end{array}$$

$$\begin{array}{r} -3x + 6 \\ + 2x \\ \hline -x + 6 \end{array}$$

$$\begin{array}{r|l} x^3 - 2x^2 - 5x + 6 & x - 1 \\ - (x^3 + x^2) & x^2 - x - 6 \\ \hline -x^2 - 5x + 6 & \\ + (x^2 - x) & \\ \hline -6x + 6 & \\ + (6x - 6) & \\ \hline 0 & \end{array}$$

جمع ضرایب فرد $\Rightarrow x = -1$
جمع ضرایب زوج $\Rightarrow$ یکی از ریشه ها

$$\begin{array}{r|l} x^3 + 2x^2 - 5x - 6 & x + 1 \\ - (x^3 - x^2) & x^2 + x - 6 \\ \hline x^2 - 5x - 6 & \\ - (x^2 - x) & \\ \hline -6x - 6 & \\ + (6x + 6) & \\ \hline 0 & \end{array}$$

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

$$\rightarrow \frac{x^3 - 2x^2 - 1}{x^3 + 2x^2 - 5x - 6}$$

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

9) $y = \sqrt{2[x] - 4}$

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

$$[x] \geq 2$$

$$x \geq 2$$

1

$$y = \sqrt{2[x] - 5}$$

$$2[x] - 5 \geq 0$$

$$[x] \geq \frac{5}{2}$$

$$x \geq 3$$

1.1

$$y = \sqrt{\frac{x+1}{x-3}} + \sqrt{\frac{7-x}{x^2+2x+2}}$$

$$\frac{x+1}{x-3} \geq 0$$

~~$$\frac{x+1}{x-3} \geq 0$$~~

$$\frac{-1}{-} \quad \frac{3}{+}$$

①

$$\frac{7-x}{x^2+2x+2} \geq 0$$

$$\frac{7}{+} \quad \frac{-}{-}$$

②

↓
 $\Delta < 0$ حصاره
 $a > 0$ بزرگتر از صفر

$$D_f = \textcircled{1} \cap \textcircled{2} = [-1, 2] - \{3\}$$

$$1) y = \sqrt{[x] \pm 8} \quad x \in \sqrt{[x] - [x]}$$

$$[x] - 8 \geq 0$$

$$[x] \geq 8$$

$$x \geq 8 \quad (1)$$

$$x - [x] \geq 0$$

$$[x] \leq x$$

$$x < 8 \quad (2)$$

$$D_f = (1) \cap (2) = \emptyset$$

2)

$$y = \frac{\sqrt{4 - x^2}}{\sqrt{4x - 3}}$$

$$4 - x^2 \geq 0$$

$$x \leq 2$$

$$4x - 3 \geq 0$$

$$x \geq \frac{3}{4}$$

$$D_f = \left(\frac{3}{4}, 2\right]$$