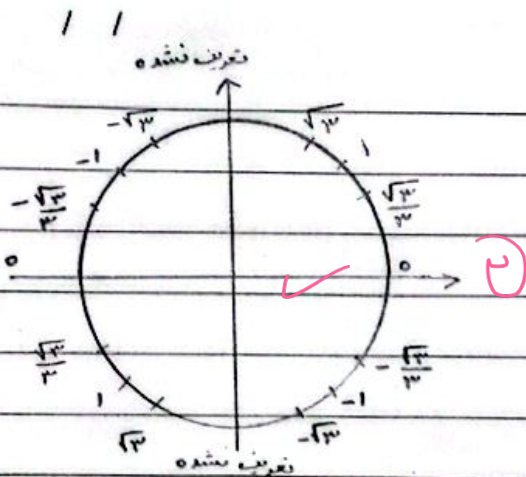


۲. آفرین عالی و کامل نوشتی



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

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

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

د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{3}) = 1 + 1 = 2$

$f(x) = \begin{cases} x^2 + f & x \geq a \\ 2x + a + r & x < a \end{cases} \xrightarrow{x \geq a} a^2 + f \geq 2a + a + r \rightarrow a^2 + a - r \geq 0 \rightarrow a \geq 1 \checkmark$

$f(x) = \begin{cases} rx^2 - b & |x+1| \geq r \\ a + rx & x \leq -1 \end{cases} \xrightarrow{x+1 \geq r} x \geq 1 \xrightarrow{x \geq 1} r(-r)^2 - b \geq a + r(-r) \rightarrow a + b \geq rf$

الف) $\frac{1}{x-f} = \frac{1}{x(x-f)} \Rightarrow \frac{1}{x-f} = \frac{1}{x(x-f)} \Rightarrow D_f = \mathbb{R} - \{0, f\}$

ب) $\frac{1}{rx^2 + rx^2 + rx + f} \Rightarrow rx^2 + rx^2 + rx + f \neq 0 \rightarrow x^2 + rx + x + f \neq 0$

$(x+r)(x) + x + f \neq 0 \rightarrow (x+r)(x+1) \neq 0 \rightarrow D_f = \mathbb{R} - \{-r\}$

الف) $\frac{1}{\sqrt{x^2-1} + \sqrt{x-2}} \xrightarrow{x-1 \geq 0, x \geq 1, x \geq 1} \frac{1}{\sqrt{x^2-1} + \sqrt{x-2}} \rightarrow D_f = [1, +\infty)$

ب) $\frac{1}{\sqrt{4x-3}} \xrightarrow{4x-3 \geq 0, x \geq \frac{3}{4}} \frac{1}{\sqrt{4x-3}} \rightarrow D_f = (\frac{3}{4}, +\infty)$

11

$$x = \sqrt{4x-a} + \sqrt{b-rx} \quad 4x-a \geq 0 \quad x \geq \frac{a}{4} \quad b-rx \geq 0 \quad x \leq \frac{b}{r} \quad \rightarrow x \in \left[\frac{a}{4}, \frac{b}{r} \right]$$

$$r = \frac{a}{4} = \frac{b}{r} \quad \boxed{\frac{b}{a} = \frac{r}{4} = \frac{1}{r}}$$

$$\text{و) } x \in \left[\frac{a}{4}, \frac{b}{r} \right] \quad x^2 - x - 4$$

$$x^2 - 1rx - 4 = (x-5)(x+9) = 0 \quad x \geq 5 \quad x \geq 9$$

$$\frac{(x-r)(x+r)}{(x-r)(x+r)(x-r)(x+r)} > 0 \quad + \frac{-r}{0} - \frac{r}{0} - \frac{r}{0} + \frac{r}{0} +$$

$$D_f = (-\infty, -r) \cup (r, +\infty) - \{r\}$$

$$\begin{array}{l} x^2 - rx - 4x + 4 \\ x^2 + rx - 4x - 4 \end{array} \quad \begin{array}{l} x^2 - rx - 4x + 4 \\ -x^2 + x^2 \end{array} \quad \begin{array}{l} x-1 \\ x^2 - x - 4 \end{array}$$

$$\begin{array}{l} x^2 + rx - 4x - 4 \\ -x^2 - x^2 \end{array} \quad \begin{array}{l} x+1 \\ x^2 + x - 4 \end{array} \quad \begin{array}{l} -x^2 - 4x + 4 \\ + x^2 - x \end{array} \quad \begin{array}{l} (x-r)(x+r) \\ (x-r)(x+r) \end{array}$$

$$\begin{array}{l} x^2 - 4x - 4 \\ -x^2 - x \end{array} \quad \begin{array}{l} (x+r)(x-r) \\ (x+r)(x-r) \end{array} \quad \begin{array}{l} -4x - 4 \\ + 4x - 4 \end{array} \quad \begin{array}{l} 0 \\ 0 \end{array}$$

$$\begin{array}{l} -4x - 4 \\ + 4x + 4 \end{array} \quad \begin{array}{l} (x-1)(x-r)(x+r) \\ (x+1)(x+r)(x-r) \end{array} \quad \begin{array}{l} 0 \\ 0 \end{array}$$

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

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

$$\text{و) } x \in \sqrt{r[x]-f} \quad r[x]-f \geq 0 \quad [x] \geq r \quad D_f = [r, +\infty)$$

$$\text{و) } x \in \sqrt{r[x]-a} \quad r[x]-a \geq 0 \quad [x] \geq \frac{a}{r} \quad D_f = \left[\frac{a}{r}, +\infty \right)$$

$$\text{و) } x \in \left[\frac{x+1}{1-x-r} + \sqrt{\frac{4-x}{x+rx+f}} \right] \quad \frac{x+1}{1-x-r} \geq 0 \quad \frac{-1}{0} + \frac{r}{0} \quad [-1, +\infty) - \{r\}$$

$$+ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100$$

$$\frac{4-x}{x+rx+f} \geq 0 \quad \frac{4}{0} - \frac{r}{0} \quad x \in [1, 4] - \{r\}$$

$$\text{و) } x \in \sqrt{[x]-f} + \sqrt{r[x]} \quad [x]-f \geq 0 \quad [x] \geq f \quad x \geq f \quad D_f = \emptyset$$

$$r[x] \geq 0 \quad [x] \leq r \quad x \leq r$$