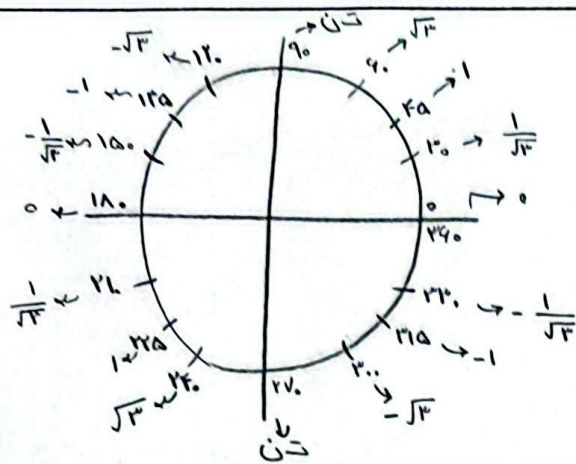




$$\tan = \frac{\sin}{\cos}$$

الف) $\sin \frac{\pi}{4} + \cos \pi + r \tan \frac{\pi}{4} = \frac{1}{r} - 1 + r(-1) = -\frac{5}{r}$

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

ج) $\cot \frac{\pi}{4} + r \cot \frac{\pi}{4} - r \tan \frac{5\pi}{4} = -\frac{1}{\sqrt{2}} + r(\frac{1}{\sqrt{2}}) - r(-\frac{1}{\sqrt{2}}) = \frac{r}{\sqrt{2}} = \frac{r\sqrt{2}}{2}$

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

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

$$a^r + ra = ra + a + r \rightarrow a^r + a - r = 0 \rightarrow \begin{cases} a = -r \\ a = 1 \end{cases}$$

① $a = -r \begin{cases} x^r + rx & x \geq -r \\ rx & x < -r \end{cases}$

$$f(1) = 5$$

② $a = 1 \begin{cases} x^r + rx & x \geq 1 \\ rx + r & x < 1 \end{cases} \quad f(1) = 5$

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

$$11 - b = a - 4 \rightarrow a + b = 15$$

الف) $y = \frac{1}{x^r - rx^r}$

$$x^r - rx^r \neq 0 \rightarrow x^r(x-r) \neq 0$$

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

ب) $y = \frac{1}{rx^r + rx^r + rx + r}$

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

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

$$D_f = \mathbb{R} - \{-1\}$$

الف) $y = \sqrt{x^r-1} + \sqrt{x-r}$

$$I: x^r-1 \geq 0 \rightarrow (x-1)(x+1) \geq 0$$

$$\frac{-1}{+1} \rightarrow (-\infty, -1] \cup [1, +\infty)$$

$$II: x-r \geq 0 \rightarrow x \geq r \rightarrow [r, +\infty)$$

$$D_f = [r, +\infty)$$

ب) $y = \frac{\sqrt{4-4x}}{\sqrt{4x-r}}$

$$I: 4-4x \geq 0 \rightarrow 4x \leq 4 \rightarrow x \leq 1$$

$$II: 4x-r \geq 0 \rightarrow 4x \geq r \rightarrow x \geq \frac{r}{4}$$

$$D_f = (\frac{r}{4}, 1]$$

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

$$D_f = \{r\}$$

$$|r-a| \rightarrow a \geq r$$

$$b-4 \geq 0 \rightarrow b \geq 4$$

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

v

$$\text{الف) } y = \sqrt{\frac{x^2-x-4}{x^2-13x^2+49}}$$

$$\frac{x^2-x-4}{x^2-13x^2+49} \geq 0 \rightarrow \frac{(x+1)(x-4)}{(x^2-9)(x^2-4)} \geq 0 \rightarrow \frac{-1}{+} \frac{-1}{-} \frac{+}{-} \frac{+}{+}$$

$$D_f = (-\infty, -1) \cup (-1, 4) \cup (4, +\infty)$$

$$\text{ب) } \sqrt{\frac{x^2-13x^2-4x+9}{x^2+13x^2-4x-9}}$$

$$\frac{x^2-13x^2-4x+9}{x^2+13x^2-4x-9} \geq 0 \rightarrow \frac{(x-1)(x+1)(x-4)}{(x+1)(x-4)(x+4)} \geq 0$$

Λ

$$\frac{x^2-13x^2-4x+9}{x^2-x^2} \quad \begin{array}{l} x-1 \\ x^2-x-9 \\ \downarrow \\ (x+1)(x-4) \end{array}$$

$$\frac{x^2+13x^2-4x-9}{x^2+x^2} \quad \begin{array}{l} x+1 \\ x^2+x-9 \\ \downarrow \\ (x-4)(x+4) \end{array}$$

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

$$D_f = (-\infty, -1) \cup [-1, 4) \cup [4, +\infty)$$

$$\text{الف) } y = \sqrt{r[x]-4}$$

$$r[x]-4 \geq 0 \rightarrow r[x] \geq 4 \rightarrow [x] \geq r \quad x \in [r, +\infty) \quad D_f = [r, +\infty)$$

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$$\text{ب) } \sqrt{r[x]-a}$$

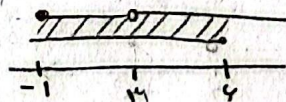
$$r[x]-a \geq 0 \rightarrow r[x] \geq a \rightarrow [x] \geq r \quad D_f = [r, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{x+1}{|x-1|}} + \sqrt{\frac{4-x}{x^2+13x+4}}$$

$$I: \frac{x+1}{|x-1|} \geq 0 \rightarrow \frac{-1}{-} \frac{+}{+} \quad [-1, 1) \cup (1, +\infty)$$

$$II: \frac{4-x}{x^2+13x+4} \geq 0$$

$$\frac{4}{+} \frac{-}{-} \rightarrow (-\infty, 4]$$



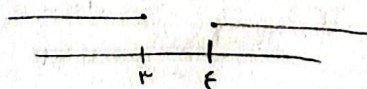
$$D_f = [-1, 1) \cup (1, 4]$$

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$$\text{ب) } y = \sqrt{[x]-4} + \sqrt{4-[x]}$$

$$I: [x]-4 \geq 0 \rightarrow [x] \geq 4 \rightarrow x \in [4, +\infty)$$

$$II: 4-[x] \geq 0 \rightarrow [x] \leq 4 \rightarrow x \in (-\infty, 4)$$



$$D_f = \emptyset$$