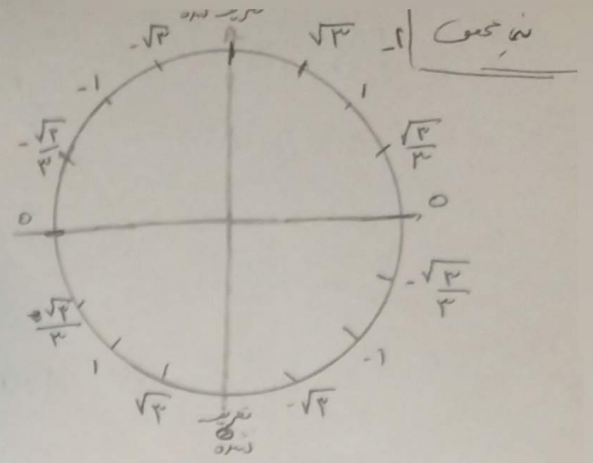




$$\text{ا) } \sin \frac{\pi}{4} + \cos \pi + r \tan \frac{\pi}{4} = \frac{1}{r} + (-1) + r(-1) = -\frac{1}{r}$$

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

$$\text{ج) } \cot \frac{\pi}{4} + r \cot \frac{\pi}{4} - r \tan \frac{\pi}{4} = \frac{\sqrt{r}}{r} + r \frac{\sqrt{r}}{r} - r \frac{\sqrt{r}}{r} = 0$$

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

$$f(x) = \begin{cases} x^r & x \geq a \\ r x + a + b & x \leq a \end{cases} \Rightarrow a^r + r a = r a + r \Rightarrow a^r + a = r \Rightarrow a = -r, \quad a > 0 \Rightarrow a = 1$$

$$\Rightarrow f(x) = r x + 1 + r = a$$

$$f(x) = \begin{cases} r x^r - b & |x+1| \geq r \rightarrow (x \leq -1, x \geq -r) \\ a + r x & -r \leq x \leq -1 \end{cases} \Rightarrow r \times 9 - b = a - r \Rightarrow a + b = 18 + r = 24$$

$$\text{ا) } y = \frac{1}{x^r - r x^r} \Rightarrow \frac{1}{x^r(x-r)} \rightarrow x=0, r \Rightarrow D_R = \mathbb{R} - \{0, r\}$$

$$\text{ب) } y = \frac{1}{r x^r + r x^r + r x + r} = \frac{1}{r(x^r + x^r + x + r)} \rightarrow x = -r \Rightarrow D_R = \mathbb{R} - \{-r\}$$

$$\text{ا) } y = \sqrt{x^r - 1} + \sqrt{x^r - r} \quad (\text{I}) \rightarrow x \geq r \quad (\text{II}) \rightarrow x^r - 1 \geq 0 \Rightarrow x \geq 1$$

$$\text{ب) } y = \frac{\sqrt{2x^r - r}}{\sqrt{4x^r - r}} \Rightarrow \frac{1}{1+1} \Rightarrow D_f = [r, +\infty)$$

$$D_f = \{r\} \quad \text{if } x=r \Rightarrow b \cdot r^r = 0 \Rightarrow b-r=0 \Rightarrow b=r \Rightarrow \frac{b}{a} = \frac{r}{1r} = 1$$

$$\text{if } x=r \Rightarrow r^r - a = 0 \Rightarrow 1r - a = 0 \Rightarrow a = 1r$$

$$1) \text{ الف) } y = \sqrt{\frac{x^2 - x - 5}{x^2 + 12x + 9}} \Rightarrow \sqrt{\frac{(x-1)(x+1)}{(x^2-9)(x^2-4)}} \quad \begin{matrix} x_1 = -1 \\ x_2 = 0 \\ x_3 = 1 \end{matrix}$$

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

$$2) \text{ ب) } y = \sqrt{\frac{x^2 - 12x^2 - 9x + 4}{x^2 + 12x^2 - 9x - 5}} \Rightarrow \sqrt{\frac{(x-1)(x^2 - x - 4)}{(x+1)(x^2 + x - 5)}} \Rightarrow \sqrt{\frac{(x-1)(x^2 - x - 4)}{(x+1)(x+1^2)(x-1^2)}}$$

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

$$3) \text{ الف) } y = \sqrt{2[x] - 4} \Rightarrow 2[x] \geq 4 \Rightarrow [x] \geq 2 \Rightarrow x \geq 2 \Rightarrow D_f = [2, +\infty)$$

$$4) \text{ ب) } y = \sqrt{2[x] - 5} \Rightarrow 2[x] \geq 5 \Rightarrow [x] \geq \frac{5}{2} \Rightarrow x \geq \frac{5}{2} \Rightarrow D_f = [\frac{5}{2}, +\infty)$$

$$5) \text{ الف) } y = \sqrt{\frac{x+1}{12x-1}} + \sqrt{\frac{9x}{x^2+12x+4}} \quad \begin{matrix} I \Rightarrow x \neq \frac{1}{12} \\ II \Rightarrow x \leq 1 \end{matrix} \Rightarrow D_f = [-1, -\frac{1}{12}] - \{\frac{1}{12}\}$$

$$6) \text{ ب) } \sqrt{[x] - 4} + \sqrt{2 - [x]} \quad \begin{matrix} I \Rightarrow [x] - 4 \geq 0 \Rightarrow [x] \geq 4 \Rightarrow x \geq 4 \\ II \Rightarrow 2 - [x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x < 3 \end{matrix} \Rightarrow D_f = \emptyset$$