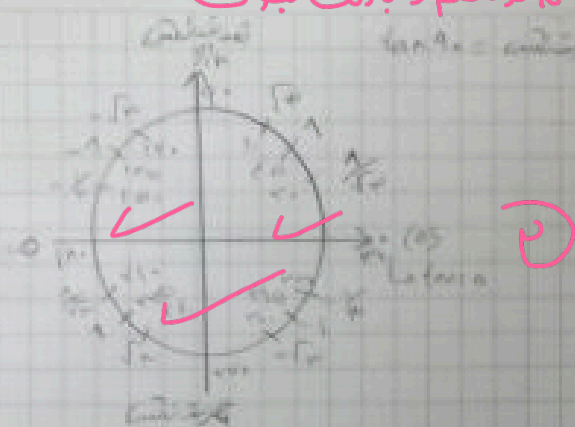




(1)

$$1) \sin \frac{\pi}{4} + \cos \frac{\pi}{4} + r \tan \frac{\pi}{4} = -\frac{1}{r} + \frac{1}{r} \quad \boxed{\frac{0}{r}}$$

(2)

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

$$3) \cot \frac{5\pi}{4} + \cot \frac{5\pi}{4} - r \tan \frac{5\pi}{4} = -\frac{1}{\sqrt{r}} + \frac{1}{\sqrt{r}} + \frac{r}{\sqrt{r}} = \frac{r}{\sqrt{r}}$$

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

$$a^2 + a - r = 0 \quad a > 0 \quad (3)$$

$$f(1) = 1 + 1 = 2$$

$$\frac{1}{a+b} - b = a - r \rightarrow a+b = \frac{1}{a-r}$$

(4)

$$|n+1| \geq r$$

$$n+1 \geq r \rightarrow \boxed{n \geq 1}$$

$$n+1 \leq -r \rightarrow \boxed{n \leq -r-1}$$

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الف) $y = \frac{1}{x^3 - 4x^2}$ چرا یقین حاصل نمی‌شود؟ (6)

$D_y = \mathbb{R} - \{0, 4\}$

$x(x^2 - 4x) \rightarrow x=0 \rightarrow x=4$

$x^2(x-4) \rightarrow x=4$

$\begin{array}{c|cc} x & 0 & 4 \\ y & -\infty & -\infty \end{array}$

①

ب) $y = \frac{1}{x^3 + 4x^2 + 4x + 4}$ (7)

$x^2(x+4)(x+1)$

$D_y = \mathbb{R} - \{-1, -4\}$

$x^2 + 4 = 0 \rightarrow x = -4$

$x^2 + 1 = 0 \rightarrow x = -1$

$\begin{array}{c|cc} x & -1 & -4 \\ y & -\infty & -\infty \end{array}$

الف) $y = \sqrt{x^2 - 1} + \sqrt{x - 4}$ (8)

$x^2 - 1 \geq 0 \rightarrow x \leq -1 \text{ or } x \geq 1$

$x - 4 \geq 0 \rightarrow x \geq 4$

$x \geq 4$

$D_y = [4, +\infty)$

②

ب) $y = \frac{\sqrt{4 - 3x}}{\sqrt{9x - 3}}$ (9)

$4 - 3x \geq 0 \rightarrow x \leq \frac{4}{3}$

$9x - 3 > 0 \rightarrow x > \frac{1}{3}$

$\frac{1}{3} < x \leq \frac{4}{3}$

$D_y = (\frac{1}{3}, \frac{4}{3}]$

$b - ax \geq 0 \rightarrow -ax \geq -b \rightarrow x \leq \frac{b}{a}$ (10)

$4x - a \geq 0 \rightarrow 4x \geq a \rightarrow x \geq \frac{a}{4}$ (11)

$\frac{a}{4} = \frac{b}{4} = 1 \rightarrow b = 4$
 $a = 12$

$\frac{4}{12} = \frac{1}{3}$

$$\text{الف) } y = \sqrt{\frac{x^2 - x - 4}{x^2 - 10x^2 + 16}}$$

x	-r	-r	r	r	
y	+	-	-	+	+

$$(-\infty, -r) \cup (r, +\infty)$$

$$(m-x)(m-x)$$

$$\frac{(x^2 - x - 4)}{x^2 - 10x^2 + 16} \geq 0$$

$$(x^2 - 9)(x^2 - 1)$$

$$(x-3)(x+3)(x-1)(x+1)$$

$$x = \pm 1, \pm 3$$

1, 3, 8

(8)

$$\text{ب) } y = \sqrt{\frac{x^2 - rx^2 - \omega x + 4}{x^2 + rx^2 - \omega x - r}}$$

x	-r-1	-1	r	r	
y	+	-	-	+	+

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

$$(m+1)(m-r)(m+r) \quad x = 1, r, -r$$

$$\frac{x^2 - rx^2 - \omega x + 4}{x^2 + rx^2 - \omega x - r} \geq 0$$

$$(x+1)(x+r)(x-r)$$

$$x = -1, r, -r$$

$$\text{ج) } y = \sqrt{x[x]-r} \rightarrow x[x]-r \geq 0 \rightarrow [x] \geq r$$

$$x \geq r$$

$$\text{د) } y = \sqrt{x[x]-\omega} \rightarrow x[x]-\omega \geq 0 \rightarrow [x] \geq \frac{\omega}{r}$$

$$x \geq \frac{\omega}{r}$$

$$\text{هـ) } y = \sqrt{\frac{x+1}{1-x-1}}$$

$$+ \sqrt{\frac{4-x}{x^2 + rx + 1}}$$

$$\frac{4-x}{x^2 + rx + 1} \geq 0$$

$$(x+1)(x+1)$$

$$x = -1, -1$$

$$x \geq -1$$

$$\frac{x+1}{x^2 + rx + 1} \geq 0$$

$$x \neq -1$$

1, 3, 8

(10)

x	-r	r	
y	+	-	-

$$-1 \leq x \leq 4$$

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Subject:

Date:

$$\therefore y = \sqrt{\frac{[n] - k}{[n] \geq k}} \quad \text{①}$$

$$+ \sqrt{x - [n]} \quad x - [n] \geq 0 \rightarrow [n] \leq x$$

② $x \leq y$

① $n \text{ ②} = \boxed{x}$

الف- ٥) $y = \frac{1}{n^3 - 4n^2} \leadsto n^3 - 4n^2 < 0 \leadsto n^2(n - 4) < 0 \begin{cases} n < 0 \\ n < 4 \end{cases}$

$D_f = \mathbb{R} - \{0, 4\}$

ب- ٥) $y = \frac{1}{n^3 + 4n^2 + 4n + 4} \leadsto n^3 + 4n^2 + 4n + 4 = 0$

$n[(n^2 + 4n) + (n^2 + 4)] = 0 \leadsto n[n(n+4) + 4(n+1)] = 0$

$= n(n+4)(n+1) = 0 \leadsto D_f = \mathbb{R} - \{-1\}$
 سهمين min دار
 بدون ریشه ت

الف- ٦) $y = \sqrt{n^2 - 1} + \sqrt{n - 2}$

عبارت زیر را ریشه باید ناقصی باشد

$n^2 - 1 \geq 0 \leadsto n^2 \geq 1 \leadsto n \geq 1 \text{ و } n \leq -1$

$n - 2 \geq 0 \leadsto n \geq 2$

$\leadsto n \geq 2 \leadsto D_f = [2, +\infty)$

الف- ٨) $y = \sqrt{\frac{n^2 - n - 4}{n^2 - 13n^2 + 34}} \leadsto \frac{n^2 - n - 4}{n^2 - 13n^2 + 34} \geq 0 \leadsto \frac{(n - 3)(n + 2)}{(n^2 - 9)(n^2 - 4)} \geq 0$

$\frac{(n - 3)(n + 2)}{(n - 3)(n + 3)(n - 2)(n + 2)} \geq 0 \leadsto \frac{-3}{+} \frac{-2}{-} \frac{2}{-} \frac{3}{+}$

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

ب-۸) $y = \sqrt{\frac{n^3 - 2n^2 - 5n + 4}{n^3 + 2n^2 - 5n - 4}} \gtrless 0 \leadsto$

مخبرهای منفی پذیر بر $(n-1)$

مخبرهای بدان زوج و فرد برابر نفس پذیر بر $(n+1)$

$$\frac{(n-1)(n^2 - n - 4)}{(n+1)(n^2 + n - 4)} \gtrless 0 \leadsto \frac{(n-1)(n-3)(n+2)}{(n+1)(n+3)(n-2)} \gtrless 0$$

$\begin{array}{ccccccc} -3 & -2 & -1 & | & 2 & 3 \\ + & - & + & - & + & - & + \end{array}$

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

الف-۱۰) $y = \sqrt{\frac{n+1}{|n-4|}} + \sqrt{\frac{4-n}{n^2+2n+2}}$

$\begin{cases} \frac{n+1}{|n-4|} \gtrless 0 \rightarrow n \geq -1, n \neq 4 \text{ I} \\ \frac{4-n}{n^2+2n+2} \gtrless 0 \rightarrow n \leq 4 \text{ II} \end{cases}$

$\Delta < 0$ در محاسبه مثبت و بدون معرکیت
 $\Delta < 0$ فقط معرکیت مفروضه!

$\xrightarrow{I \cap II} D_f = [-1, 3) \cup (3, 4] \subseteq [-1, 4] - \{4\}$