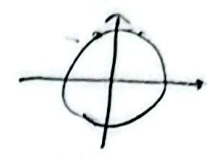


الف) $\frac{\sin \frac{\pi}{2}}{\frac{1}{2}} + \frac{\cos \pi}{-1} + \frac{2 \tan \frac{\pi}{2}}{-1} = -1 + \frac{1}{2} = -\frac{1}{2}$ -۲

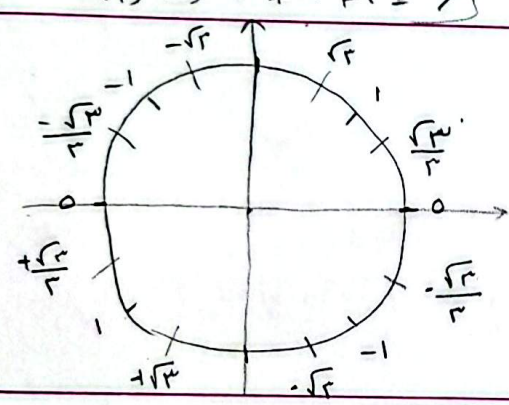
ب) $\frac{-\cos \frac{4\pi}{2}}{\frac{\sqrt{3}}{2}} + \frac{\sin \frac{2\pi}{2}}{\frac{\sqrt{3}}{2}} - \frac{2 \sin \frac{5\pi}{2}}{\frac{2}{2}} = \frac{4\sqrt{3}}{2} = 2\sqrt{3}$



۲) $\cot \frac{\pi}{2} + 2 \cot \frac{5\pi}{2} - 2 \frac{\tan \frac{4\pi}{2}}{\frac{2}{2}} = -\frac{\sqrt{3}}{2} + \sqrt{3} + \frac{2\sqrt{3}}{2} = \frac{\sqrt{3}}{2} + \sqrt{3} = \frac{3\sqrt{3}}{2}$

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

$a^r + \frac{1}{a} = \frac{1}{a} + r \rightarrow a^r - a - r = 0$ بیم ضربه با تاز صاف زد
 $a > 0 \quad f(r) \rightarrow r + r + r = 3$ +۲



۱- تاثیرات $k\pi + \frac{\pi}{2}$ تقریب نشده

$f(x) = \begin{cases} rx^r - b & |x+1| > r \rightarrow x+1 > r \rightarrow x > r-1 \\ a+rx & -r \leq x \leq -1 \end{cases}$ ۴-

$x = -r \rightarrow a - b = a \cdot 4 \rightarrow a + b = 15$

الف) $y = \frac{1}{x^r - rx^r}$ $x^r - rx^r \neq 0$
 $x^r(x-r) \neq 0 \rightarrow D_f = \mathbb{R}_+ - \{0, r\}$ ۵-

ب) $y = \frac{1}{rx^r + rx^r + rx^r}$ $rx^r + rx^r + rx^r \neq 0$
 $rx^r(x+r) + r(x+r) \neq 0 \rightarrow (x+r)(x^r+1) \neq 0 \quad D_f = \mathbb{R}_+ - \{-r\}$

الف) $y = \sqrt{x^r-1} + \sqrt{x-r}$ (I) $x^r-1 \geq 0 \rightarrow x \geq 1$ (II) $x-r \geq 0 \rightarrow x \geq r$
 $(I) \cap (II) \rightarrow D_f = [r, +\infty)$ ۶-

ب) $y = \frac{\sqrt{5-rx}}{\sqrt{4x-r}}$ $5-rx \geq 0 \rightarrow rx \leq 5 \rightarrow x \leq \frac{5}{r}$
 $4x-r \geq 0 \rightarrow rx \leq 4 \rightarrow x \leq \frac{4}{r}$ $D_f = (-\infty, \frac{1}{r})$

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

$$\begin{aligned} 4x - a &= 0 \\ 4x &= a \\ x &= \frac{a}{4} \end{aligned}$$

$$\begin{aligned} b - 4x &= 0 \\ b &= 4x \\ \frac{b}{4} &= x \end{aligned}$$

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

اگر دو عبارت را برابر با یک عدد است پس باید تمام جمله ها در دو
طرف جمع در عبارت برابر صفر باشد
این در صورتی ممکن است که

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

$$\begin{array}{c} -2 \quad -2 \quad 2 \quad 2 \\ + \quad | \quad - \quad | \quad - \quad | \quad + \\ \hline 0 \quad 0 \quad 0 \quad 0 \end{array}$$

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

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

$$2) \sqrt{\frac{x^3 - 2x^2 - 2x + 6}{x^3 + 2x^2 - 2x - 6}} \geq 0$$

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

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

$$\begin{array}{c} -2 \quad -2 \quad -1 \quad 1 \quad 2 \quad 2 \\ + \quad | \quad - \quad | \quad + \quad | \quad - \quad | \quad + \\ \hline 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \end{array}$$

$$D_f = \mathbb{R} - [0, 2) \cup (-1, 1) \cup [2, 2)$$

$$3) y = \sqrt{x-2} \cdot f \quad x[x] - 2 \geq 0 \rightarrow [x] - 2 \geq 0 \rightarrow [x] \geq 2 \rightarrow x \geq 2$$

$$D_f = [2, +\infty)$$

$$4) \sqrt{x[x] - 2} \quad x[x] - 2 \geq 0 \rightarrow [x] \geq \frac{2}{x} \rightarrow x \geq 2 \quad D_f = [2, +\infty)$$

$$5) y = \sqrt{\frac{x+1}{x^2-1}} + \sqrt{\frac{4-x}{x^2+2x+2}}$$

$$\begin{array}{c} -1 \quad 1 \\ + \quad | \quad + \\ \hline 0 \quad 0 \end{array}$$

$$D_f = [-1, 4] - \{1\}$$

$$6) y = \sqrt{x-4} + \sqrt{4-x}$$

$$D_f = \emptyset$$

$$\begin{array}{c} 4 \quad 4 \\ + \quad | \quad + \\ \hline 0 \quad 0 \end{array}$$

$$\begin{array}{c} 4 \quad 4 \\ + \quad | \quad + \\ \hline 0 \quad 0 \end{array}$$

$$(I) [4, +\infty)$$

$$(II) (-\infty, 4)$$

$$(I) \cap (II) = \emptyset$$