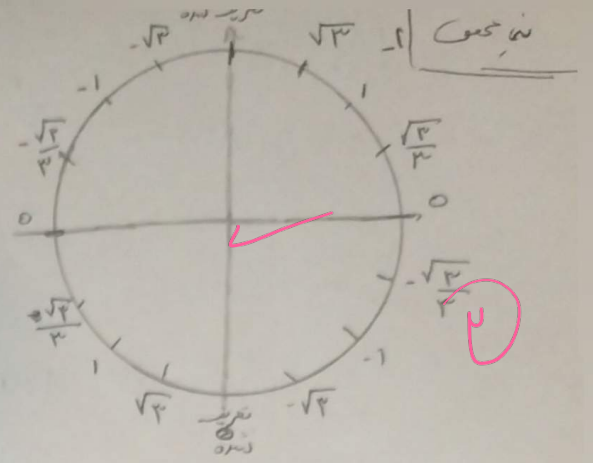


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الف) $\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{3\pi}{4} = \frac{1}{\sqrt{2}} + (-1) + 2(-1) = -\frac{3}{\sqrt{2}}$

ب) $-\cos \frac{5\pi}{4} + \sin \frac{3\pi}{4} - 2 \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} - \frac{2\sqrt{2}}{2} = \frac{2\sqrt{2} - 2\sqrt{2}}{2} = 0$

ج) $\cot \frac{2\pi}{4} + 2 \cot \frac{\pi}{4} - 2 \tan \frac{3\pi}{4} = -\frac{\sqrt{2}}{\sqrt{2}} + 2 \times \frac{\sqrt{2}}{\sqrt{2}} - 2 \times \frac{\sqrt{2}}{\sqrt{2}} = -1 + 2 - 2 = -1$

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

اصل صفحه آخر نوشته شد!

$f(x) = \begin{cases} x^2 + 2x & x \geq a \\ 2x + a + 1 & x \leq a \end{cases} \Rightarrow a^2 + 2a = 2a + 1 \Rightarrow a^2 + a = 1 \Rightarrow a = -2, 1 \quad a > 0 \Rightarrow a = 1$
 $\Rightarrow f(1) = 2(1) + 1 + 1 = 4$

$f(x) = \begin{cases} 2x^2 - b & |x+1| \geq 2 \rightarrow (x \leq -3, x \geq 1) \\ a + 2x & -2 \leq x \leq 1 \end{cases} \Rightarrow 2 \times 9 - b = a - 2 \Rightarrow a + b = 18, 2 = 14$

الف) $y = \frac{1}{x^2 - 2x^2} \Rightarrow \frac{1}{x^2(x-2)} \rightarrow x = 0, 2 \Rightarrow D_R = \mathbb{R} - \{0, 2\}$

ب) $y = \frac{1}{2x^2 + 4x^2 + 2x + 2} = \frac{1}{2(x^2 + 2x^2 + x + 1)} \rightarrow x = -1 \Rightarrow D_R = \mathbb{R} - \{-1\}$

الف) $y = \sqrt{x^2 - 1} + \sqrt{x^2 - 4} \quad (I) \rightarrow x \geq 1 \quad (II) \rightarrow x^2 - 1 \geq 0 \Rightarrow x \geq 1$

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

$D_f = \{2\}$ if $x = 2 \Rightarrow b - 2x = 0 \Rightarrow b - 4 = 0 \Rightarrow b = 4$
 if $x = 2 \Rightarrow 4x - a = 0 \Rightarrow 12 - a = 0 \Rightarrow a = 12$

$$1) y = \sqrt{\frac{x^2 - x - 5}{x^2 + 12x + 9}} \Rightarrow \sqrt{\frac{(x-1)(x+1)}{(x^2+9)(x^2-4)}} \quad x_1 = 0$$

$$\Leftrightarrow D_f = (-\infty, -1) \cup (1, +\infty) - \{2\}$$

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

$$D_f = (-\infty, -1) \cup [-1, 1) \cup [2, +\infty)$$

$$x \text{ ت.ن. } x$$

$$1, 1/2$$

$$1) y = \sqrt{12[x] - 5} \Rightarrow 12[x] \geq 5 \Rightarrow [x] \geq 1/2 \Rightarrow x \geq 1 \Rightarrow D_f = [1, +\infty)$$

$$2) y = \sqrt{12[x] - 5} \Rightarrow 12[x] \geq 5 \Rightarrow [x] \geq 1/2 \Rightarrow x \geq 1 \Rightarrow D_f = [1, +\infty)$$

$$3) y = \sqrt{\frac{12x+1}{12x-1}} + \sqrt{\frac{12x}{12x^2+12x+4}}$$

$$I \Rightarrow x \neq 1/2$$

$$II \Rightarrow x \leq 1$$

$$\Rightarrow D_f = [-1, -1/2] - \{1/2\}$$

$$4) \sqrt{[x] - 5} + \sqrt{12 - [x]}$$

$$I \Rightarrow [x] - 5 \geq 0 \Rightarrow [x] \geq 5 \Rightarrow x \geq 5$$

$$II \Rightarrow 12 - [x] \geq 0 \Rightarrow [x] \leq 12 \Rightarrow x < 12$$

$$ج - ٢) C \cdot t \frac{r_1}{r} + r C \cdot t \frac{r_2}{r} - r b a n \frac{a_1}{y} = -\sqrt{\frac{r}{r}} + r \left(\sqrt{\frac{r}{r}} \right) - r \left(-\sqrt{\frac{r}{r}} \right) = \frac{r \sqrt{r}}{r}$$

الف - ٨) $y = \sqrt{\frac{n^2 - n - 4}{n^2 - 13n^2 + 14}} \leadsto \frac{n^2 - n - 4}{n^2 - 13n^2 + 14} \geq 0 \leadsto \frac{(n-3)(n+2)}{(n^2-9)(n^2-4)} \geq 0$

$$\frac{(n-3)(n+2)}{(n-3)(n+3)(n-2)(n+2)} \geq 0 \leadsto \begin{array}{ccccccc} & -3 & & -2 & & 2 & & 3 \\ & * & & * & & & & * \\ + & \cancel{0} & - & \cancel{0} & - & \cancel{0} & + & \cancel{0} & + \end{array}$$

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