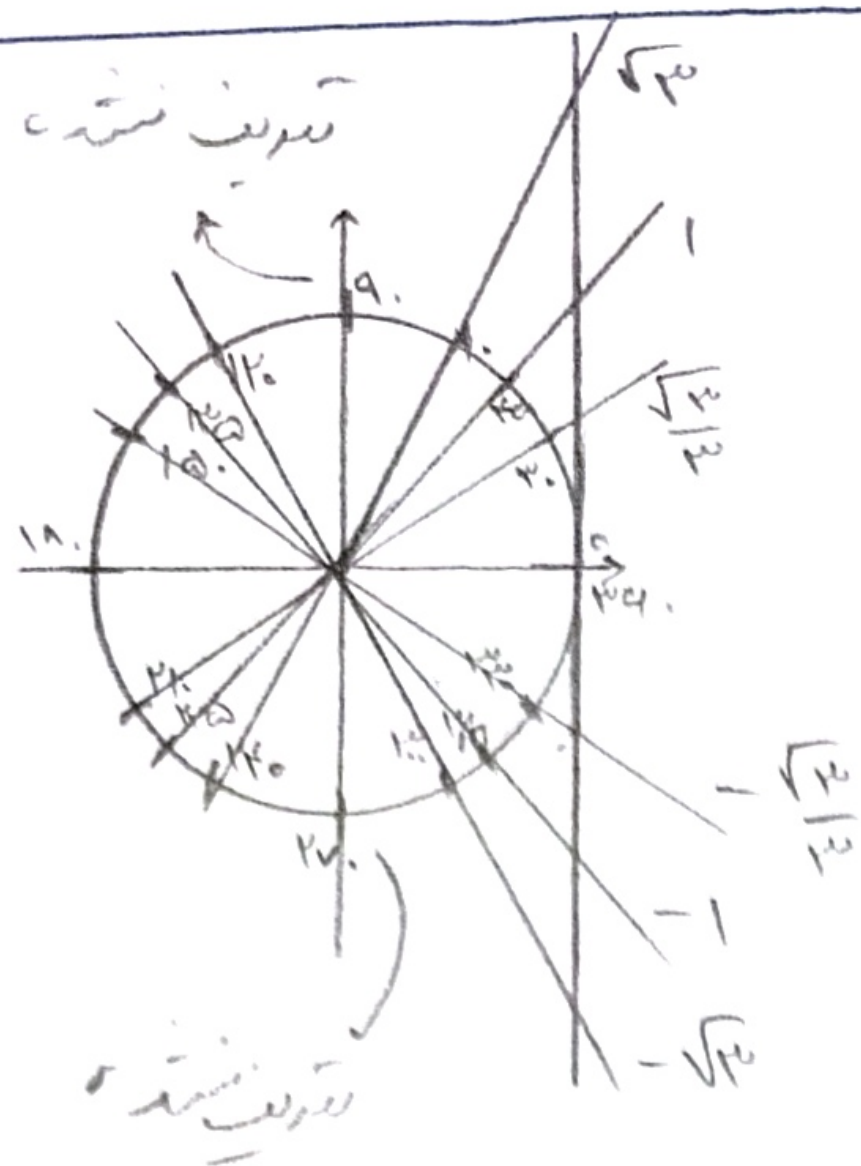




$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha}$$

$$\tan_{\pi/6} = \frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{3}}$$

$$\tan_{\pi/4} = 1$$

$$\tan_{\pi/2} = \sqrt{3}$$

$$\tan_{\pi} = 0 \Rightarrow \sin = 0 \Rightarrow 0$$

$$\tan_{3\pi/4}$$

مربع

$$\tan_{\pi/2} \Rightarrow \cos = 0$$

$$\tan_{\pi/4}$$

$$\tan_{\pi/2} = -\frac{\sqrt{3}}{1} \times 1 = -\sqrt{3}$$

$$\tan_{3\pi/4} = -1$$

$$\tan_{\pi} = -\frac{\sqrt{3}}{\sqrt{3}}$$

$$\tan_{\pi/6} = \frac{\sqrt{3}}{\sqrt{3}}$$

$$\tan_{\pi/4} = 1$$

$$\tan_{\pi/2} = \sqrt{3}$$

$$\tan_{\pi} = -\sqrt{3}$$

$$\tan_{3\pi/4} = -1$$

$$\tan_{\pi/6} = \frac{\sqrt{3}}{\sqrt{3}}$$

$$الف) \frac{1}{\sqrt{3}} + (-1) + 1(-1) = \frac{1}{\sqrt{3}} - 1 - 1 = \frac{1-4}{\sqrt{3}} = -\frac{3}{\sqrt{3}}$$

$$ب) (-\frac{\sqrt{3}}{\sqrt{3}}) + \frac{\sqrt{3}}{\sqrt{3}} - 1(-\frac{\sqrt{3}}{\sqrt{3}}) = \frac{\sqrt{3}}{\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{\sqrt{3}}$$

$$ج) -\frac{\sqrt{3}}{\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{3}}$$

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

$$x^r + r = a \quad \left\{ \begin{array}{l} x^r + r = r x + a + r \\ x^r + r = a + r \end{array} \right.$$

$$r x + r = a \quad \left\{ \begin{array}{l} x^r + r = a + r \\ x^r + r = a + r \end{array} \right.$$

$$r x + r = 0$$

$$x + 1 = 0$$

$$x = -1$$

$$1 - r = a + r$$

$$-r = a$$

$$f(1) \rightarrow 1, -1$$

$$1 + r = a = f(1)$$

$$x > 0 \rightarrow x + 1 > 1 \rightarrow x > 0$$

$$x < 0 \rightarrow x + 1 < 1 \rightarrow x < 0$$

$$-1 < x < 1 \rightarrow D_f = [-1, 1]$$

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

$$\rightarrow x = -1$$

$$r(-1)^r - b = a + r(-1)$$

$$1 - b = a - 1$$

$$1 - 1 = a + b$$

$$r = a + b$$

$$ا) x^r - r x^r \neq 0 \quad x^r (x - r) \neq 0$$

$$x \neq 0 \quad x \neq r$$

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

$$ب) r x^r + r x^r + r x + r \neq 0$$

$$r x^r (x + r) + r (x + r) \neq 0$$

$$\mathbb{R} - \{r\} (x + r) (r x^r + r) \neq 0$$

$$\uparrow x \neq -r$$

$$r x^r \neq -r$$

$$x^r \neq -1 \rightarrow \mathbb{R}$$

$$\rightarrow D_f = \mathbb{R} - \{-r\}$$

ا) $x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1, x \leq -1 \} \xrightarrow{\wedge} D_f = [1, +\infty)$
 $x - 2 \geq 0 \rightarrow x \geq 2$

ب) $4 - 3x \geq 0 \rightarrow 3x \leq 4 \rightarrow x \leq \frac{4}{3}$
 $4x - 3 > 0 \rightarrow 4x > 3 \rightarrow x > \frac{3}{4}$ $\} \xrightarrow{\wedge} \frac{3}{4} < x \leq \frac{4}{3}$

$x = 2$

$4(2) - a \geq 0 \rightarrow a \leq 12$

$b - 3x = 0$

$b - 3(2) = 0 \rightarrow b = 6$

$\frac{b}{a} = \frac{6}{12} = \frac{1}{2}$

⑤

ا) $\frac{x^2 - x - 4}{x^2 - 13x - 34} \geq 0 \rightarrow \frac{(x-4)(x+1)}{(x-13)(x+2)(x-2)(x-1)} \geq 0 \rightarrow \frac{1}{(x+13)(x-2)} \geq 0$

①

$(x+13)(x-2) \geq 0$
 $\frac{-13}{-} \quad \frac{2}{+}$
 $x \neq -13, 2, -2, 1$ $D_f = (-\infty, -13) \cup (2, 13) \cup (13, +\infty)$

ب) صواب : $1 - 2 - a + 4 = 0 \rightarrow x = 1$ $(x-1)(x^2 - x - 4) = (x-1)(x-4)(x+1)$
 $\frac{1}{-} \quad \frac{4}{+} \quad \frac{-1}{-}$

كج : $1 - a = 2 - 4 \rightarrow x = -1$ $(x+1)(x^2 + x - 4) = (x+1)(x+4)(x-1)$
 $\frac{-1}{-} \quad \frac{-4}{-} \quad \frac{1}{+}$

$\frac{-13}{+} \quad \frac{-2}{+} \quad \frac{-1}{+} \quad \frac{1}{+} \quad \frac{2}{+} \quad \frac{13}{+}$
 $+ \quad - \quad + \quad - \quad + \quad - \quad +$

$D_f = (-\infty, -13) \cup [-2, 1) \cup [1, 2) \cup [13, +\infty)$

ا) $f(x) - 1 \geq 0 \rightarrow f(x) \geq 1 \rightarrow [x] \geq 1$ $D_f = [1, +\infty)$
 $x \geq 2$

⑨

ب) $f(x) - \infty \geq 0 \rightarrow f(x) \geq \infty \rightarrow [x] \geq \frac{\infty}{f}$
 $[x] \geq \frac{\infty}{f}$
 $[x] \geq 3 \rightarrow x \geq 3$ $D_f = [3, +\infty)$

ا) $\frac{x+1}{|x-3|} \geq 0$ $x+1 \geq 0$ $|x-3| \neq 0$
 $x \geq -1$ $x \neq 3$

$D_f = [1, 3) \cup (3, +\infty)$ $\} \xrightarrow{\wedge} [-1, 3) \cup (3, 4]$

⑩

$\frac{4-x}{x^2+2x+1} \geq 0$ $4-x \geq 0$ $x \leq 4$ $D_f = (-\infty, 4]$

$\Delta = 4 - 14 = -10 < 0$ $\rightarrow$ مستقيم

ب) $[x] - 1 \geq 0$ $1 - [x] \geq 0$
 $[x] \geq 1$ $[x] \leq 1$
 $x \geq 2$ $x \leq 1$

$\} \xrightarrow{\wedge} \emptyset$