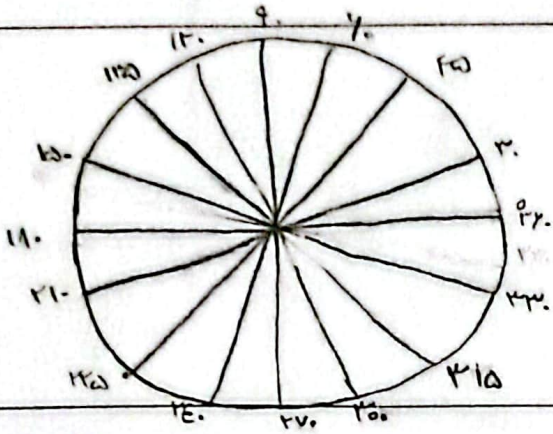




$$\begin{aligned} \tan 30^\circ &= +\frac{1}{\sqrt{3}} \\ \therefore 30^\circ &= +1 \\ \therefore 60^\circ &= +\sqrt{3} \\ \therefore 90^\circ &= \infty \\ \therefore 120^\circ &= -\sqrt{3} \\ \therefore 150^\circ &= -1 \\ \therefore 180^\circ &= 0 \\ \therefore 210^\circ &= +\frac{1}{\sqrt{3}} \end{aligned}$$

$$\begin{aligned} \tan 240^\circ &= +1 \\ \therefore 240^\circ &= +\sqrt{3} \\ \therefore 270^\circ &= \infty \\ \therefore 300^\circ &= -\sqrt{3} \\ \therefore 330^\circ &= -1 \\ \therefore 0^\circ &= 0 \end{aligned}$$

۱

الف) $\sin 30^\circ + \cos 180^\circ + 2 \tan 135^\circ$
 $= \frac{1}{2} - 1 + 2(-1) = -\frac{1}{2} - 2 = -\frac{5}{2}$

ج) $\cot 120^\circ + 3 \cot 240^\circ - 2 \tan 150^\circ$
 $= -\frac{1}{\sqrt{3}} + 3\left(\frac{1}{\sqrt{3}}\right) - 2\left(-\frac{1}{\sqrt{3}}\right) = \frac{2\sqrt{3}}{3}$

۲

ب) $-\cos 150^\circ + \sin 180^\circ - 3 \sin 240^\circ$
 $= -\left(-\frac{\sqrt{3}}{2}\right) + 0 - 3\left(-\frac{\sqrt{3}}{2}\right) = \frac{\sqrt{3}}{2} + \frac{3\sqrt{3}}{2} = 2\sqrt{3}$

د) $\cos(0) + \sin\left(\frac{180^\circ}{2}\right)$
 $= 1 + 1 = 2$

۳

$$x^2 + 5x = 2n + a + 2$$

$$f(1) = x^2 + 2n - a - 2 = 0$$

$$x^2 + 2n - a - 2 = 0$$

$$= 1 + 2 - a - 2 = 0$$

$$a = 1$$

$$f(x) = \begin{cases} x^2 + 5x > 1 \\ 2n + a + 2 \leq 1 \end{cases}$$

$$f(1) = 0$$

۴

$$x^2 - b \quad |n+1| \geq 2$$

$$a + 2x \quad -2 \leq x \leq -1$$

$$x > 0 \quad x < 0$$

$$f(x) = 1n - b = a - 9$$

$$x+1 \geq 2 \quad -x-1 \geq 2$$

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

$$x > 1 \quad x < -2$$

۵

الف) $\frac{1}{x^2 - 5x^2} \quad D: \mathbb{R} - \{f\}$

ب) $\frac{1}{x^2 + 5x^2 + 2x + 2} \Rightarrow D: \mathbb{R} - \{-2\}$

$$x^2 - 5x^2 \neq 0$$

$$x^2 + 5x^2 + 2x + 2 \neq 0$$

$$x^2 \neq 5x^2$$

$$x^2(x+2) + 2(x+1) \neq 0$$

$$x \neq 2$$

$$(x+2)x(x+1) \neq 0 \Rightarrow x \neq -2$$

$$x^2 = -1$$

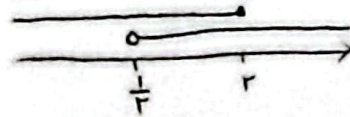
$$\text{عقده های پیچیده ندارد.}$$

الف) $x^2 - 1 > 0$ $x - 2 > 0$
 $x^2 > 1$ $x > 2$
 $x > 1$ $x < -1$



$D: (-\infty, -1] \cup [2, +\infty)$

ب) $4 - 3x > 0$ $x - 2 > 0$
 $4 > 3x$ $x > 2$
 $\frac{4}{3} > x$



$D: (\frac{4}{3}, 2]$

6

$4x - a > 0$ $b - 3x > 0$
 $x > \frac{a}{4}$ $x < \frac{b}{3}$

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

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$\frac{a}{4} < x < \frac{b}{3}$ $\frac{a}{4} = 2$ $\frac{b}{3} = 2$
 با توجه $a = 8$ $b = 6$

الف) $\frac{x^2 - x - 4}{x^2 - 13x^2 + 34} > 0$

$x^2 - x - 4 = 0$

$x = -2, 4$

$x^2 = t$ $t^2 - 13t + 34$
 $(t - 4)(t - 9)$

$t = 4$ $t = 9$
 $x^2 = 4$ $x^2 = 9$
 $x = \pm 2$ $x = \pm 3$

$D: (-\infty, -2) \cup (2, 4) \cup (9, +\infty)$

ب) $\frac{x^3 - 3x^2 - 2x + 4}{x^3 + 5x^2 - 6x - 4} > 0$

$(x-1)(x-3)(x+4) > 0$ $x = 1, 3, -4$
 $(x+1)(x+3)(x-2)$ $x = -1, -3, 2$

$\frac{-3 - 2 - 1}{+} \frac{1}{-} \frac{2}{+} \frac{3}{+}$

$D: (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$

8

الف) $2[x] - 4 > 0$

$2[x] > 4$

$[x] > 2$

$D: [3, +\infty)$

ب) $2[x] - 5 > 0$

$2[x] > 5$

$[x] > \frac{5}{2}$

$[x] > 2.5$

$[x] > 3$

$D: [3, +\infty)$

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الف) $\frac{x+1}{|x-3|} > 0$

$x = -1$ $|x-3| = 0$

$x > 0$ $x < 0$

$x = 3$ $-x-3 = 0$
 $x = -3$

$\frac{-3 - 1}{-} \frac{1}{+} \frac{3}{+}$

$D = \{4\}$

$(-3, -1] \cup (3, +\infty)$

$\frac{4-x}{x^2+3x+4} > 0$

$x = 4$

مخرج همیشه ندارد!

ب) $[x] - 4 > 0$

$[x] > 4$

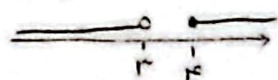
$[4, +\infty)$

$2 - [x] > 0$

$2 > [x]$

$(-\infty, 2)$

$D = \emptyset$



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