باران عسگری دهم ت ۱۵

(۱)

$$\begin{cases} 9 - 3a + b \\ 1 - a + b \end{cases}$$

$8 - 2a = 0 \rightarrow a = 4 \Rightarrow 9 - \cancel{12} + b = 0 \Rightarrow b = 3$

$a + b = 4 + 3 = \boxed{7}$

(۲)

$y = \left((k-2)x + m - 1\right)(\underbrace{x - 3n}_{x=-1})^2$

$\rightarrow -1 \Rightarrow -3n = 1$ $\quad \boxed{n = -\frac{1}{3}}$

$k - 2 < 0 \rightarrow k < 2 \xrightarrow{k \in N} \boxed{k = 1}$

$x = 4$

$(1-2)(4) + m - 1 = 0 \rightarrow -4 + m - 1 = 0$ $\quad \boxed{m = 5}$

$$\begin{cases} n = -\frac{1}{3} \\ m = -3 \\ k = 1 \end{cases} \Rightarrow \frac{m}{n} + k = -14$$

مضاعف

$a < 0$ $\quad ax^2 + bx + c$

(۳)

$-\frac{1}{2}x^2 + 2x + 6 > \frac{7}{2}$

$-\frac{1}{2}x^2 + 2x + \frac{12}{2} - \frac{7}{2} > 0 \xrightarrow[b^2 - 4ac]{\Delta} 4 - 4\left(\frac{5}{2}\right)\left(-\frac{1}{2}\right) = 9 \rightarrow \sqrt{\Delta} = 3 \rightarrow x_{1,2} = \frac{-b \pm \sqrt{\Delta}}{2a}$

$\frac{-2+3}{-1} = -1$ $\quad \frac{-2-3}{-1} = 5$

$(-1, 5) \longrightarrow (a, b) \Rightarrow +5 - (-1) = 6$

(۴)

$-x^2(-x+3) - x + 3 \longrightarrow (\underbrace{-x+3}_{x=3})(\underbrace{-x^2+1}_{x=\pm 1})<0$

ساده / ۴ ریشه

$(a, b) \rightarrow (1, 3)$

مضاعف = ۲

$f(x) = 8 - 12 - 2 + 3 = -3$

(۵)

$(a-1)x^2 + (a-1)x + 1 \xrightarrow{\text{همواره} -} \begin{cases} a < 0 \rightarrow a - 1 < 0 \rightarrow a < 1 & a \in (-\infty, 1) \\ \cap \\ \Delta < 0 \rightarrow \underbrace{(a-1)^2 - 4(a-1)}_{b^2 - 4ac} = a^2 + 1 - 2a - 4a + 4 = a^2 - 6a + 5 = (a-5)(a-1) \end{cases}$

$(1, 5)$

$\cap$ $\quad \varnothing$

(۶)

$\frac{x(x^3 + x)}{x - 2} > 0 \rightarrow \frac{x^2(x^2+1)}{x-2} > 0$ $\rightarrow$ همواره + $\rightarrow x = 0$ مضاعف

$x \in (2, +\infty)$

(۷)

$\frac{(x^2 - x - 6)(x-1)^3}{(x^2+x+1)(2-x)^3} \geq 0$

> 0

$(x-3)(x+2)$

$x \in [-2, 2) \cup [3, +\infty)$

8)

$y - f(x) > 0 \qquad 2 - \frac{3x^2-2x}{x^2+4} \to \frac{2x^2+8-3x^2+2x}{x^2+4} \to \frac{-x^2+2x+8}{\underbrace{x^2+4}_{\text{همواره }+}} > 0$

$\frac{-2\pm\sqrt{4+32}}{-2}$ ⟨ -2 , 4

$-2 \quad 4$: $- \;\; + \;\; -$ $\to (-2, 4)$ $\to \boxed{b-a=6}$

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9)

$-1 < \frac{3x^2-4x}{x+1} \to \frac{3x^2-4x+x+1}{x+1} > 0 \to \frac{3x^2-3x+1}{\cancel{x}+1} > 0 \quad \Delta < 0 \qquad -1: \; - \;\; + \qquad (-1, +\infty)$ ①

$\cap$

$\frac{3x^2-4x}{x+1} < 0 \to \frac{x(3x-4)}{\cancel{x}+1} < 0 \qquad -1 \quad 0 \quad \frac{4}{3}: \; - \;\; + \;\; - \;\; +$

$x \in (-\infty, -1) \cup (0, \frac{4}{3})$

$\boxed{① \cap ② = (0, \frac{4}{3})}$

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10)

$\frac{x^2-10}{x} \leq 3 \to \frac{x^2-10-3x}{x} \leq 0 \to \frac{(x-5)(x+2)}{\cancel{x}} \leq 0 \qquad -2 \quad 0 \quad 5: \; - \;\; + \;\; - \;\; +$

$x \in (-\infty, -2] \cup (0, 5]$

نازنین عسگری دهم ریاضی B