Subject: عمادی سبزعلی

۲۰

Date:

~~[illegible]~~

① $x^2 - ax + b \quad 1^2 - a + b = 0 \to 1 = a - b \to 3 = 3a - 3b$

$9 - 3a + b \to 9 = 3a - b \xrightarrow{\times(-3)} 9 = 3a - b$

$6 = 2b \to b = 3$

$1 = a - 3 \to a = 4$

1		3	
+	−	+	

$a + b = 7$

② $y = ((k-2)x + m - 1)(x - 3n)^2 \quad -1 - 3n = 0$

$-1 = 3n \to n = -\frac{1}{3} \quad ((k-2)4 + m - 1) \quad 4k - 8 + m - 1 = m \to 9 - 4k$

$-\frac{1}{3}$ *		4	
+	+	−	

$\frac{m}{n} + k \to \frac{9 - 4k}{-\frac{1}{3}} + k \to$

$-27 + 12k + k = 13k - 27 \to 13 - 27 = -14$ ($k = 1$)

$((k-2)x + (9 - 4k) - 1)(x+1)^2$

$((k-2)x + 8 - 4k)(x+1)^2$

$(xk - 2x + 8 - 4k)(m+1)^2$

$k(x - 4) - 2(x - 4)$

$(x-4)(x-2)$

$\to (k-2)(x-4)(x+1)^2$

$(x-4) > 0 \quad \} \quad x + 1 > 0$

$x > 4$

$k - 2 < 0 \to k < 2$

تا منفی است

$k = 1$ → منفی است

(3)

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

$-\frac{1}{2}x^2 + 2x + 6 > \frac{7}{2} \xrightarrow{\times 2} -x^2 + 4x + 12 > 7 \Rightarrow -x^2 + 4x + 5 > 0$

$x_1 = -1$ $x_2 = 5$

$-1 \quad 5$; $- \; + \; -$ $\to (-1, 5)$

$b - a = 5 - (-1) = 6$

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(4)

$f(x) = x^3 - 3x^2 - x + 3$ $(x-1)(x+1)(x-3)$

$x < 0$

$-1 \quad 1 \quad 3$; $- \; + \; - \; +$

$(-\infty, -1) \cup (1, 3) \to (1, 3) \to \frac{1+3}{2} = 2$

$f(2) = 2^3 - 3(2)^2 - 2 + 3 \to 8 - 12 - 2 = -6 + 3 = -3$

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(5)

$(a-1)x^2 + (a-1)x + 1$ $\Delta < 0$ $b^2 - 4ac < 0$

$(a-1)^2 - 4(a-1)(1) \to a^2 + 1 - 2a - 4a + 4 < 0 \to a^2 - 6a + 5 < 0$

$1 \quad 5$

$a < 0 \to a - 1 < 0 \to a < 1$

$1 \quad 5$; $+ \; - \; +$

$1 \quad 5$

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(۶)

$$\begin{array}{c|c|c} & 0 & 2 \\ \hline - & - & + \end{array} \rightarrow (2, +\infty)$$

(۷)

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

$3 \quad -2 \quad -1 \quad 2 \quad 3$

$$\begin{array}{ccccc} + & - & - & + & - \end{array}$$

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

(8)

$$\frac{3x^2-2x}{x^2+4} = 2 \rightarrow 3x^2-2x = 2x^2+8 \rightarrow x^2-2x-8=0$$

$\Delta = 4-4(1)(-8) = 36$ $\quad \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow 4, \rightarrow -2$

$$\begin{array}{cc} -2 & 4 \\ \hline + \;|\; - & |\; + \end{array}$$

$(-2, 4) \rightarrow (a, b) \rightarrow b-a \rightarrow 4-(-2) = 6$

پس برای $y=2$

(9)

$$-1 < \frac{3x^2-4x}{x+1} < 1 \rightarrow 0 < \frac{3x^2-4x}{x+1} + 1 \rightarrow 0 < \frac{3x^2-4x+x+1}{x+1}$$

$\rightarrow \Delta = b^2-4ac$

$$0 < \frac{3x^2-3x+1}{x+1} \quad 9-4(3)(1) = -3$$

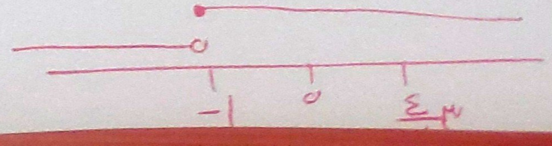
همواره (+)

$$\begin{array}{c} -1 \\ \hline - \;|\; + \end{array} \quad (-1, +\infty)$$

$$\frac{3x^2-4x}{x+1} < 0 \rightarrow \Delta = b^2-4ac \rightarrow 16-4(3)(0) = 16$$

$$\frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{4}{3}, \rightarrow 0$$

$$\begin{array}{ccc} -1 & 0 & \frac{4}{3} \\ \hline - \;|\; + & |\; - & |\; + \end{array} \quad (-\infty, -1) \cup (0, \frac{4}{3})$$



$(0, \frac{4}{3})$

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$$\frac{x^2-10}{x} \leq 3 \rightarrow \frac{x^2-10}{x} - 3 \leq 0 \rightarrow \frac{x^2-10-3x}{x} \leq 0$$

(10)

$$\frac{(x+2)(x-5)}{x} \leq 0$$

$$\begin{array}{c|ccccc} & -2 & & 0 & & 5 \\ \hline - & | & + & | & - & | & + \end{array} \quad (-\infty, -2] \cup (0, 5]$$