نام و نام خانوادگی: تانیا ترک ترابی — سری: — گروه: دهم یکشنبه

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$x^2 - ax + b$

$1 < x < 3$

$a + b = 7$

	1		3	
+	0	−	0	+

$1 - a + b = 0 \Rightarrow 9 - 3a + b = 0 \Rightarrow b - a = -1 \Rightarrow b - 3a = -9$

$\Rightarrow b = a - 1 \Rightarrow b = 3a - 9 \Rightarrow a - 1 = 3a - 9 \Rightarrow 2a = 8 \Rightarrow$

$a = 4$

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	-1		4	
+	0	+	0	−

$(-2k + 2 + m - 1)(-1 + 3n)^2 = 0$

$(m - k + 1)(-1 - 3n)^2 = 0$

ل $\begin{cases} m - k = -1 \to m = k - 1 \ ✗ \\ n = -\frac{1}{3} \ ✗ \end{cases}$

$(4k - 8 + m - 1)(4 - 3n)^2 = 0$

$(4k - 9 + m)(4 - 3n)^2 = 0 \Rightarrow$ درست

ل $\begin{cases} 4k + m = 9 \Rightarrow m = 9 - 4k \ ✗ \\ n = \frac{4}{3} \ ✗ \end{cases}$

$k - 2 < 0 \to k < 2 \to k = 0 \qquad 3n = -1,\ n = -\frac{1}{3}$

$y = ((k-2)x + m - 1)(x - 3n)^2 \longrightarrow (k - 2)(4) + m - 1 = 0 \Rightarrow 4k - 8 + m - 1 = 0 \Rightarrow 4k + m = 9$

$\frac{m}{n} + k = \frac{5}{-\frac{1}{3}} + 1 = \boxed{-14}$

$4 + m = 9 \to m = 5$

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

$\Rightarrow -x^2 + 4x + 5 > 0 \to -(\underbrace{x^2 - 4x - 5}_{(x+1)(x-5)}) > 0$

$-1 \qquad +5$

	-1		5	
−	0	+	0	−

$\to (-1, 5)$

$5 - (-1) = \boxed{6}$

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

(a, b)

$\xrightarrow{x > 0} (x^2 - 4x + 3)(x + 1)$

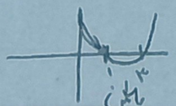
$\hookrightarrow (x - 3)(x - 1)(x + 1)$

$x = 3$

$x = 1$

$x = -1$ غ‌ق‌ق

$$\begin{array}{l|l} x^3 - 3x^2 - x + 3 & x + 1 \\ \hline -x^3 - x^2 & x^2 - 4x + 3 \\ -4x^2 - x + 3 & \\ +4x^2 + 4x & \\ 3x + 3 & \\ -3x - 3 & \\ 0 & \end{array}$$



$\hookrightarrow (1, 3) \to \frac{3 + 1}{2} = 2$

$$\begin{array}{l|l} x^3 - 3x^2 - x + 3 & x - 1 \\ \hline -x^3 + x^2 & x^2 - 2x - 3 \\ -2x^2 - x + 3 & \\ +2x^2 - 2x & \\ -3x + 3 & \\ +3x - 3 & \\ 0 & \end{array}$$

$(x^2 - 2x - 3)(x - 1)$

$(x - 3)(x + 1)$

$x = 3$

$x = 1$

$x = -1$ ✗

$f(2) = 8 - 3(4) - 2 + 3 \Rightarrow$

$8 - 12 - 2 + 3 = \boxed{-3}$

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① $\Delta < 0 \to (a - 1)^2 - 4(a - 1) \times 1 < 0 \to a^2 - 2a + 1 - 4a + 4 < 0 \to \underbrace{a^2 - 6a + 5}_{(a-1)(a-5)} < 0$

$\to 1 \qquad \to 5$

	1		5	
+	0	−	0	+

$\to \boxed{(1, 5)}$

اشتراک ① ② $\to a = 1,\ a = 5$

② $a < 0 \to a - 1 < 0 \to \boxed{a < 1}$

$$\frac{m(\overbrace{m^3+m}^{m^4+m^2})}{m-2} > 0 \Rightarrow \frac{m^2(m^2+1)}{m-2} > 0$$

$m^2 \to 0$, $m-2 \to 2$

0		2	
− 0	−	‖	+

$(2, +\infty)$

$m = 0$ $\quad m = 2$

$m^2 = -1$ غ ق ق 6

$$\frac{(\underbrace{x^2-x-6}_{(x+2)(x-3)})(x-1)^2}{(\underbrace{x^2+x+1}_{\Delta<0})(2-x)^3} \leq 0$$

$(x+2) \to -2$, $(x-3) \to 3$, $(x-1)^2 \to 1$, $(2-x)^3 \to 2$

−2	1	2	3
+ 0 −	0 −	‖ +	0 −

$[-2, 2) \cup [3, +\infty)$ 7

$$\frac{3x^2-2x}{x^2+4} < 2 \to 3x^2-2x < 2x^2+8 \Rightarrow \underbrace{x^2-2x-8}_{(x+2)(x-4)} < 0$$

$(x+2) \to -2$, $(x-4) \to +4$

−2	+4
+ 0 −	0 +

$(-2, 4)$ 8

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① $-1 < \frac{3x^2-4x}{x+1} \to \frac{\overbrace{3x^2-4x+x+1}^{3x^2-3x+1 \to \Delta<0}}{x+1} > 0 \to$

$x+1 \to -1$

−1
− ‖ +

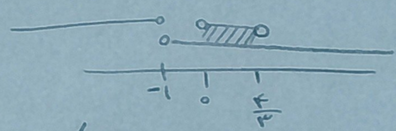
$(-1, +\infty)$

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

$x \to 0$, $(3x-4) \to \frac{4}{3}$, $x+1 \to -1$

−1	0	$\frac{4}{3}$
− ‖ +	0 −	0 +

$(-\infty, -1) \cup (0, \frac{4}{3})$ اشتراک ① و ② $\to (0, \frac{4}{3})$



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

$(x-5)(x+2)$: 5, -2; $x \to 0$

−2	0	5
− 0 +	‖ −	0 +

$(-\infty, -2] \cup (0, 5]$ 10