۲۶

آتریسا آقاصالحی

۱)

$$\begin{array}{ccccc} & 1 & & 3 & \\ \hline + & \circ & - & \circ & + \end{array}$$

$1 \to 0 = 1 - a + b \Rightarrow \overset{\times -3}{(-a+b=-1)}$

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

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

$-2b = -6$

$\boxed{b=3} \to \boxed{a=4}$

$a + b = 3 + 4 = 7$

۲)

-1 = ریشه مضاعف

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

$$\begin{array}{ccccc} & -1 & & 4 & \\ \hline + & \circ & + & \circ & - \end{array}$$

$kx - 2x + m - 1$

$3n = -1$

$n = -\frac{1}{3}$

$4k - 8 - 1 + m = 4k + m - 9 = 0$

$4k + m = 9$

$\frac{m}{n} + k = \frac{-3}{-\frac{1}{3}} + 3 = 12$

۳)

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

$\underset{a}{-\frac{1}{2}x^2} + \underset{b}{2x} + \underset{c}{\frac{5}{2}} > 0$

$a + b = c \begin{cases} x = -1 \\ x = -\frac{c}{a} = -5 \end{cases}$

$-\frac{c}{a} = -\frac{\frac{5}{2}}{\frac{1}{2}} = -5$

$$\begin{array}{ccccc} & -5 & & -1 & \\ \hline - & \circ & + & \circ & - \end{array}$$

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

$b - a = -1 - (-5) = +4$

۴)

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

$x(x^2-1) - 3(x^2-1) \to (x^2-1)(x-3) < 0$

عزق $x>0$

$$\begin{array}{cccccc} -1 & & 1 & & 3 & \\ \hline - & | + & \circ & - & \circ & + \end{array}$$

1 و -1 ، 3

$(1,3)$ ـ تعداد صحیح = ۲

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

۵)

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

$(a-1)(a-5) < 0$

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

ج.ع $= (-\infty, 1) \xleftarrow{\text{اشتراک}} a<1$ ، $a<5$

6)

$$\frac{m(m^3+m)}{m-2} > 0 \longrightarrow \frac{m^2\overbrace{(m^2+1)}^{\text{همواره }+}}{m-2} > 0$$

$m-2 \to 2$

		0		2		
+		0	−	⊘		+

$(-\infty, 0] \cup (2, +\infty)$

7)

$$\frac{\overset{3}{(x-3)}\,\overset{-2}{(x+2)}\,\overset{1 \text{ مضاعف}}{(x-1)^2}}{\underbrace{(x^2+x+1)}_{\text{همواره }+}\,\underset{2}{(2-x)^3}}$$

	−2		1 (مضاعف)		2		3	
−	0	+	0	+	⊘	−	0	+

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

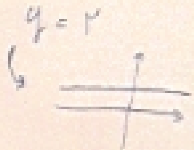
8)

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

$3x^2-2x < 2x^2+8$

$x^2-2x-8 < 0$

$(x-4)(x+2) < 0$



	−2		4	
+	0	−	0	+

$-2 < x < 4$

$b - a = 4 - (-2) = \underline{6}$

9)

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

	−1		0		$\frac{4}{3}$	
−	⊘	+	0	−	0	+

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

$3x^2-3x+1 > 0 \longrightarrow \Delta < 0$ همواره +

$(-1, 0] \cup [\frac{4}{3}, +\infty)$

10)

$$\frac{x^2-10}{x} \leqslant 3$$

$x^2-10 \leqslant 3x$

$x^2-3x-10 \leqslant 0$

$(x-5)(x+2) \leqslant 0$

	−2		5	
+	0	−	0	+

$$\boxed{-2 \leqslant x \leqslant 5}$$