۱) $(x-1)(x-3)=x^2-4x+3 \Rightarrow \begin{matrix}a=4\\ b=3\end{matrix}$ $\quad a+b=7$

۲) $(x-3n)^2 \to 3n=-1 \to n=-\frac{1}{3}$ $\quad (k-2)x+m-1=0 \to 3k-6+m=0 \Rightarrow k=1$

$-x+m-1 \to -3-1+m=0 \Rightarrow m=4$ $\quad \frac{4}{\frac{-1}{3}}+1=-12+1=-11$

۳) $-\frac{1}{3}x^2+2x+2 \geq \frac{7}{3} \to x^2-6x-5<0$ $\quad (x-5)(x+1)<0$ $\quad \begin{array}{ccccc} & -1 & & 5 & \\ + & 0 & - & 0 & + \end{array}$

$(-1,5) \to b-a=5-(-1)=6$

۴) $x^3-3x^2-x+3<0$ $\quad x(x^2-1)-3(x^2-1)<0$ $\quad (x^2-1)(x-3)<0$ $\quad \begin{array}{ccccccc} & -1 & & 1 & & 3 & \\ - & 0 & + & 0 & - & 0 & + \end{array}$

$\left.\begin{matrix}x<-1 \cup 1<x<3\\ x>0\end{matrix}\right\} \cap \Rightarrow 1<x<3$ $\quad (a,b) \to (1,3)$ $\quad \frac{1+3}{2}=2$ $\quad f(2)=-3^2$

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

$\begin{array}{ccccc} & 1 & & 5 & \\ + & 0 & - & 0 & + \end{array}$ $\quad (1,5) \cap (-\infty,1) = \varnothing$

۶) $\frac{m(m(m^2+1)}{m-2}$ $\quad \begin{array}{ccccc} & * & & 2 & \\ - & 0 & - & 0 & + \end{array}$ $\quad m=(2,+\infty)$

۷) $\frac{(x-3)(x+2)(x-1)^2}{(x^2+x+1)(2-x)^3} \leq 0$ $\quad \begin{array}{ccccccc} & -2 & & -1 & 2 & & 3 \\ + & 0 & - & 0 & - & + & 0 & - \end{array}$ $\quad [-2,2) \cup [3,+\infty)$

۸) $\frac{3x^2-2x}{x^2+4}<2 \to \frac{x^2-2x-8}{x^2+4}=\frac{(x-4)(x+2)}{x^2+4}<0$ $\quad \begin{array}{ccccc} & -2 & & 4 & \\ + & 0 & - & 0 & + \end{array}$ $\quad (-2,4)$ $\quad 4-(-2)=6$

۹) $\frac{3x^2-3x}{x+1}=\frac{x(3x-3)}{x+1}<0$ $\quad \begin{array}{ccccc} & -1 & & 0 & & 1 \\ - & \nexists & + & 0 & - & 0 & + \end{array}$ $\quad (-\infty,-1) \cup (0,1)$

$\frac{3x^2-3x}{x+1}+1>0$ $\quad \frac{3x^2-2x+1}{x+1}>0$ $\quad \Delta<0$ $\quad a>0$ $\quad$ جواب ندارد

$\left.\begin{matrix}\\ \\ (-1,+\infty)\end{matrix}\right\} \cap \to (0,1)$

۱۰) $\frac{x^2-10}{x}-3=\frac{x^2-10-3x}{x}=\frac{(x-5)(x+2)}{x} \leq 0$ $\quad \begin{array}{ccccc} & -2 & & 0 & & 5 \\ - & 0 & + & \nexists & - & 0 & + \end{array}$ $\quad (-\infty,-2] \cup (0,5]$

Pasha