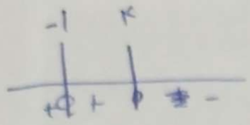
سیدحسین دهم ریاضی B
۲۰

-۱ معادله بازه (۱,۳) منفی است } ریشه‌ها ۱,۳ معادله $(x-1)(x-3) = x^2 - 4x + 3$

$\Rightarrow a + b = 7$ ✓ (۲)

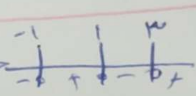
-۲  $\Rightarrow -1 \to$ ریشه مضاعف، داریم $(x-3n)^2 \Rightarrow 3n = 1 \Rightarrow n = \frac{-1}{3}$

$k - 2 = -1 \Rightarrow k = 1$

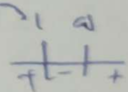
۴ ریشه، داریم $((k-2)x + m - 1) \longrightarrow m - 1 = 4 \Rightarrow m = 5$

تابع $\longrightarrow (x-4)(x+1)^2$ 　　 $\frac{m}{n} + k = \frac{5}{\frac{-1}{3}} + 1 = -14$ ✓ (۲)

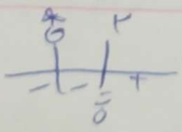
-۳ $y = -\frac{1}{2}x^2 + 2x + 6 > \frac{7}{2} \Rightarrow y > \frac{7}{2}$
$x^2 - 4x - 5 = (x-5)(x+1) < 0$ } $-1 < x < 5 \Rightarrow b - a = 5 - (-1) = 6$ ✓ (۲)

-۴ $x^3 - 3x^2 - x + 3 = (x-1)(x+1)(x-3) \longrightarrow$  ، $\left.\begin{matrix} x > 0 \\ y < 0 \end{matrix}\right\} \Rightarrow (1,3)$ 　 $\frac{1+3}{2} = 2$ — نقطه میانی

$f(2) = 8 - 12 - 2 + 3 = -3$ ✓ (۲)

-۵ $(a-1)x^2 + (a-1)x + 1 < 0 \Rightarrow \begin{cases} a - 1 < 0 \Rightarrow a < 1 \\ \Delta < 0 \Rightarrow (a-1)^2 - 4(a-1) = (a-1)(a-5) \Rightarrow \end{cases}$ $\to$  $(1,5)$

$\Rightarrow$ اشتراک $\to (I) \cap (II) = \varnothing$ ✓ (۲)

-۶ $\frac{m^2(m^2+1)}{m-2} > 0 \Rightarrow$  $\longrightarrow (2, +\infty)$ ✓ (۲)

-۷

$$\frac{(x-3)(x+2)(x-1)^2}{(x^2+x+1)(2-x)^3}\le 0 \longrightarrow$$

Sign chart: points $-2,\ 1,\ 2,\ 3$; signs $-\ |\ +\ |\ +\ |\ -\ |\ +$

$\Rightarrow [-2,2)\cup[3,+\infty)$ ✓

(۲)

-۸

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

$x^2+4 \leftarrow$ همیشه مثبت است

$\Rightarrow x^2-2x-8\ge 0 \Rightarrow$ roots $4,\ -2$

Sign chart: points $-2,\ 4$; signs $+\ |\ -\ |\ +$

$b-a=4-(-2)=6$ ✓

(۲)

-۹

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

$$\frac{3x^2-4x}{x+1}\le 0 \Rightarrow$$

Sign chart: points $-1,\ 0,\ \frac{4}{3}$; signs $-\ |\ +\ |\ -\ |\ +$

$(-1,+\infty)\cap\left([0,\tfrac{4}{3}]\cup(-\infty,-1)\right)$

$=[0,\tfrac{4}{3}]$ ✓

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

$3x^2-3x+1 \rightarrow$ ریشه ندارد

$x+1 \rightarrow x=-1$

$\Rightarrow$ Sign chart: point -1; signs $-\ |\ +$ $\rightarrow x>-1$

(۲)

-۱۰

$$\frac{x^2-10}{x}\ge 3 \Rightarrow \frac{x^2-3x-10}{x}\ge 0 \longrightarrow$$

Sign chart: points $-2,\ 0,\ 5$; signs $-\ |\ +\ |\ -\ |\ +$

$x\in(-\infty,-2]\cup(0,5]$ ✓

(۲)