

$$x^2 - \alpha x + b = P(x) \quad x \in (1, 3) \Rightarrow P(x) < 0 \quad \left. \begin{array}{l} x \leq 1 \\ x \geq 3 \end{array} \right\} P(x) \geq 0$$

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 اعداد صحیح عبارت هستند  
 $P(x) = (x-1)(x-3) \Rightarrow x^2 - 4x + 3 = x^2 - \alpha x + b$   
 $\Rightarrow \alpha = 4, b = 3 \quad \alpha + b = 4 + 3 = 7$  جواب نهایی

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 $((k-2)x + m-1)(x-3n)^2$   
 $\underbrace{-x+4}_{-x+4} \quad \underbrace{x-3n=0}_{x=-1} \xrightarrow{x=-1} -1-3n \geq 0 \Rightarrow -3n \geq 1$   
 $\rightarrow n \leq -\frac{1}{3} \rightarrow (x-3(-\frac{1}{3}))^2 \Rightarrow (x+1)^2$   
 $(k-2)\epsilon + m-1 = 0 \rightarrow \epsilon k + m - 9 \geq 0 \xrightarrow{k \geq 1} \epsilon + m - 9 = 0$   
 $\Rightarrow m = 9 \rightarrow (-x+4)(x+1)^2$   
 $\xrightarrow{k \geq 1} n = -\frac{1}{3} \quad \frac{+5}{-\frac{1}{3}} = -15 + 1 = -14$  جواب نهایی

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 $-\frac{1}{4}x^2 + 2x + 9 > \frac{1}{4} \rightarrow -\frac{1}{4}x^2 + 2x + 9 - \frac{1}{4} > 0$   
 $9 - \frac{1}{4} = \frac{35}{4} \quad -\frac{1}{4}x^2 + 2x + \frac{35}{4} > 0 \xrightarrow{x(-2)} (-2)(-\frac{1}{4}x^2) + (-2)(2x) + (-2)(\frac{35}{4}) < 0$   
 $\Rightarrow x^2 - 4x - 35 < 0 \quad (x-7)(x+5) < 0 \quad \left. \begin{array}{l} x_1 = -5 \\ x_2 = 7 \end{array} \right\}$   
 $a = -1 \quad b = 7 \quad b - a = 7 - (-1) = 8 + 1 = 9$  جواب نهایی

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 $f(x) = x^3 - 3x^2 - x + 3 \rightarrow f(x) = x^2(x-3) - 1(x-3) \rightarrow f(x) = (x-3)(x^2-1)$   
 $\rightarrow f(x) = (x-3)(x-1)(x+1) \quad \frac{-1 \quad 1 \quad 3}{-4+6-6+} \quad f(x) < 0 \rightarrow (1, 3) \cup (-\infty, -1)$   
 $x > 0 \rightarrow (1, 3) \Rightarrow$  بازه مورد نظر  $\left. \begin{array}{l} a = 1 \\ b = 3 \end{array} \right\} \frac{1+3}{2} = 2 \rightarrow$  نقطه میانی  
 $f(2) = (2-3)(2-1)(2+1) \Rightarrow (-1)(1)(3) \Rightarrow f(2) = -3$  جواب نهایی

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 $P(x) = (a-1)x^2 + (a-1)x + 1 < 0$   
 $A = a-1 \quad A < 0 \Rightarrow a-1 < 0 \rightarrow a < 1 \rightarrow (-\infty, 1) \textcircled{1}$   
 $B = a-1 \quad \Delta < 0 \Rightarrow (a-1)^2 - 4(a-1)(1) < 0 \rightarrow (a-1)[(a-1)-4] < 0$   
 $C = 1 \quad (a-1)(a-5) < 0 \quad \frac{1 \quad 5}{+4-6+} \Rightarrow (1, 5) \textcircled{2}$   
 $(-\infty, 1) \cap (1, 5) = \emptyset$  جواب نهایی

$$\frac{m(m^r+m)}{m-r} > 0 \rightarrow \frac{m^r(m^r+1)}{m-r} > 0$$

$$\frac{-1 \quad 0 \quad 1 \quad r}{-\phi - \phi - \phi - \phi +} \rightarrow \boxed{m > r} \quad \text{جواب نہی}$$

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$$\frac{(x^r - x - r)(x-1)^r}{(x^r + x + 1)(r-x)^r} \leq 0 \rightarrow \frac{(x-r)(x+r)(x-1)^r}{(x^r + x + 1)(r-x)^r} \leq 0$$

$$\frac{-r \quad 1 \quad r \quad r}{+\phi - \phi - \phi + \phi -} \Delta < 0$$

$$\rightarrow \boxed{[-r, r] \cup [r, +\infty)} \quad \text{جواب نہی}$$

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$$\frac{rx^r - rx}{x^r + r} < r \rightarrow rx^r - rx < r(x^r + r) \rightarrow rx^r - rx < rx^r + r$$

$$rx^r - rx - r < 0 \rightarrow \begin{cases} x_1 = -r \\ x_2 = r \end{cases} \Rightarrow -r < x < r \quad (-r, r)$$

$$b - a = r - (-r) = 2r \quad \text{جواب نہی}$$

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$$-1 < \frac{rx^r - rx}{x+1} < 0 \rightarrow \frac{rx^r - rx}{x+1} > -1 \Rightarrow \frac{rx^r - rx}{x+1} < 0$$

$$\frac{rx^r - rx}{x+1} < 0 \rightarrow \frac{x(rx - r)}{x+1} < 0 \rightarrow \frac{-1 \quad 0 \quad r}{-\phi + \phi - \phi +} \rightarrow (-\infty, -1) \cup (0, \frac{r}{\mu}) \quad ①$$

$$\frac{rx^r - rx}{x+1} > -1 \rightarrow \frac{rx^r - rx}{x+1} + 1 > 0 \rightarrow \frac{rx^r - rx + (x+1)}{x+1} > 0 \rightarrow \frac{rx^r - rx + 1}{x+1} > 0$$

$$x+1 > 0 \Rightarrow x > -1 \rightarrow (-1, \infty) \quad ②$$

$$① \cap ② \Rightarrow \boxed{(0, \frac{r}{\mu})} \quad \text{جواب نہی}$$

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$$\frac{x^r - 1}{x} \leq r \rightarrow \frac{x^r - 1}{x} - r \leq 0 \rightarrow \frac{x^r - 1 - rx}{x} \leq 0 \rightarrow \frac{x^r - rx - 1}{x} \leq 0$$

$$\frac{(x-\infty)(x+r)}{x} \leq 0 \rightarrow \frac{-r \quad 0 \quad \infty}{-\phi + \phi - \phi +} \rightarrow \boxed{(-\infty, -r] \cup (0, \infty)} \quad \text{جواب نہی}$$

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