نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۷ کلاس .....

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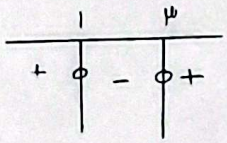

$x^2 - ax + b$

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

$x^2 - 4x + 3 = x^2 - ax + b$

$a = 4 \quad , \quad b = 3 \Rightarrow a + b = 7$

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$(x-3n)^2 = (x+1)^2$

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

$k - 2 < 0 \rightarrow k < 2$

طبیعی $\rightarrow k = 1$

$-x^2 + m - 1 = 0 \rightarrow m = 5$

$\frac{5}{-\frac{1}{3}} + 1$

$-15 + 1 = -14$

۳

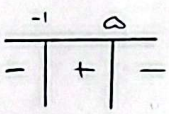
$-\frac{1}{2}x^2 + 2x + 4 > \frac{7}{2}$

$2\left(-\frac{1}{2}x^2 + 2x + 4 - \frac{7}{2} > 0\right)$

$-x^2 + 4x + 8 - 7 > 0$

$-x^2 + 4x + 5 > 0 \rightarrow x^2 + 4x - 5 < 0 \rightarrow (x+5)(x-1) < 0$

$a = \frac{-5}{1}$ $\quad \frac{1}{1} = -1$



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

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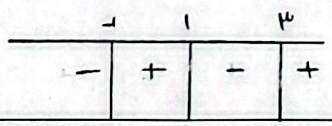
$x^3 - 3x^2 - x + 3 < 0$

$-x^2(-x+3) - x + 3 < 0$

$(-x+3)(-x^2+1) < 0$

$-x+3 = 0 \rightarrow x = 3$ $\quad -x^2+1 = 0 \rightarrow x = \pm 1$



$(1, 3) \rightarrow f(2) = 8 - 12 - 4 + 3 = -5$

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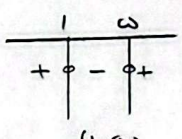
$(a-1)x^2 + (a-1)x + 1 < 0$

$\Delta < 0 \rightarrow \Delta = b^2 - 4ac = (a-1)^2 - 4(a-1) < 0$

$a^2 + 1 - 2a - 4a + 4 < 0$

$a^2 - 6a + 5 < 0 \rightarrow (a-1)(a-5) < 0$

$a - 1 < 0 \rightarrow a < 1$



$(1, 5)$

جواب $\rightarrow \emptyset$ $\quad a < 1 \cup (1, 5)$

۶

$\frac{m(m^3+m)}{m-2} = \frac{m\times m(m^2+1)}{m-2} > 0$

(m^2+1: همواره ⊕ ; $m = 0^*$; $m-2 \to 2$)

Sign chart: 0^*, 2 : $-$ | $-$ | $+$

$(2, +\infty)$

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$\frac{(x^2-x-6)(x-1)^2}{(x^2+x+1)(2-x)^3} \le 0$

$(x-3)(x+2)$ → 3, -2 ; $(x-1)^2$ → 1^* ; $(2-x)^3$ → 2

$\Delta = b^2-4ac = 1-4<0$ همواره ⊕

Sign chart: -2, 1^*, 2, 3 : $+$ | $-$ | $-$ | $+$ | $-$

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

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

$\to \frac{x^2-2x-8}{x^2+4} < 0$ (x^2+4: همواره +)

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

$(x-4)(x+2)<0$ → 4, -2

Sign chart: -2, 4 : $+$ | $-$ | $+$

$(-2, 4) = (a, b)$

$a = -2 , b = 4$

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

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

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

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

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

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

$0 < \frac{3x^2-4x+x+1}{x+1} \Rightarrow 0 < \frac{3x^2-3x+1}{x+1}$ (همواره +) , $\Delta = b^2-4ac = 9-12 = -3$; $x+1$ → -1

Sign chart: -1 : $-$ | $+$

$(-1, +\infty)$

Intersection: $(0, \frac{4}{3})$

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$\frac{x^2-10}{x} \le 3 \to \frac{x^2-10}{x} - 3 \le 0 \to \frac{x^2-10-3x}{x} \le 0 \to \frac{x^2-3x-10}{x} \le 0 \to \frac{(x-5)(x+2)}{x} \le 0$ ($x \ne 0$)

Sign chart: -2, 0, 5 : $-$ | $+$ | $-$ | $+$

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