Subject:
Date:

$a+1<3$ $\quad a<2$ $\qquad a-2<-3$ $\quad a+3<5$ $\quad a=-1$

(1)

x^2-ax+b $\qquad 1<x<3$ $\qquad a+b=?$

$x=2$ $\quad 4-2a+b<0$ $\qquad -2a+b<-4$

$x=4$ $\quad 16-4a+b\geq 0$ $\qquad -4a+b<-16$

(2)

$y=((k-2)x+m-1)(x-3n)^2$ $\qquad (5k-10+m-1)(5-3n)^2<0$

x		-1		4	
P	+	0	+	0	−

$5k+m<11$

$(m-1)(-3n)^2>0$

$(-k+2+m-1)(-1-3n)^2=0$ $\qquad m-1>0 \Rightarrow m>1$

$-k+m=-1$ $\qquad -3n-1=0$

$-3n=1$

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

(3)

$-\frac{1}{4}x^2+2x+9$ $\qquad (a,b)$

$-\frac{1}{4}(a+1)^2+2(a+1)+9>\frac{7}{2}$

$-\frac{1}{4}a^2-\frac{1}{4}-\frac{a}{2}+2a+2+9>\frac{7}{2}$

$-\frac{1}{4}a^2+a>\frac{7}{2}-4$ $\qquad -\frac{1}{4}a^2+a+2>0$

$\Delta=1-4(-\frac{1}{4})(2)=9$

$a=\frac{-1\pm 3}{-1}$ ⇒ (4), (−2)

$x=3 \Rightarrow -\frac{1}{4}(9)+6+9=7.5$ $\qquad 3>-2 \Rightarrow a=-2$

$x=-4$ $\quad -\frac{1}{4}(16)+2(-4)+9=9$

$x=-1$

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(4)

$f(x) = x^3 - 3x^2 - x + 3$ $\quad x > 0$

[illegible]

5. $(a-1)x^2 + (a-1)x + 1$

$\begin{cases} \Delta < 0 \\ a < 0 \end{cases}$

$(a-1)^2 - 4(a-1) < 0$

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

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

$a - 1 < 0$

$a < 1$ $\quad (-\infty, 1)$

x		1		5	
P	+	0	-	0	+

$(1, 5)$

$(-\infty, 5)$

6. $\frac{m(m^3+m)}{m-2} > 0$ $\quad \rightarrow m^2(m^2+1)$

x		-1		0		2	
P	-	0	+	0	-	0	+

$(-\infty, -1) \cup (0, 2)$

7. $\frac{(x-3)(x+2)(x-1)^2}{(x^2+x+1)(2-x)^3} < 0$

$\Delta < 0$

x		-2		1 (زوج)		2		3	
P	+	0	-	0	-	0	+	0	-

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

8. $\frac{3x^2 - 2x}{x^2 - 4} < \frac{2}{1} \Rightarrow 3x^2 - 2x < 2x^2 + 8$

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

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

$x(3x-4)$ $\quad 0, \frac{4}{3}$

x		-2		4	
P	+	0	-	0	+

$(-2, 4)$

9. $\frac{3x^2 - 4x}{x+1} < 0$ $\quad (-1)$

x		-1		0		$\frac{4}{3}$	
P	-	0	+	0	-	0	+

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

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

$\Delta = 9 - 4(3)(1) =$ $\quad \Delta < 0$

(-1)

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$x > -1$ $\quad (-1, +\infty)$ ☆☆

$(x-5)(x+2)$ → ۵ → −۲

۴۰. $\dfrac{x^2 - 10 - 3x}{x} \le 0 \Rightarrow \dfrac{x^2 - 3x - 10}{x} \le 0$ → ۰

x		-2		0		5	
P	$-$	۰	$+$	∄	$-$	۰	$+$

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

اشتباه است.