نام و نام خانوادگی ...[illegible]... پاسخنامه تشریحی تکلیف شماره ...۶... کلاس ...دهم پنجشنبه...

۱

الف) $\dfrac{x+4}{4x^3-16x^2+31x-15} = \dfrac{x+4}{(x-1)(2x-3)(2x-5)}$

$$\begin{array}{r|l} 4x^3-20x^2+31x-15 & x-1 \\ -(4x^3-4x^2) & 4x^2-16x+15 \\ -16x^2+31x-15 & \hookrightarrow (2x-3)(2x-5) \\ -(-16x^2+16x) & \\ 15x-15 & \\ -(15x-15) & \\ 0 & \end{array}$$

$D_f = \mathbb{R} - \{1, \frac{3}{2}, \frac{5}{2}\}$

ب) $\dfrac{x+3}{3x^3-x^2-8x-4} = \dfrac{(x+3)}{(x+1)(3x^2-4x-4)}$

$$\begin{array}{r|l} 3x^3-x^2-8x-4 & x+1 \\ -\ 3x^3+3x^2 & 3x^2-4x-4 \\ -4x^2-8x-4 & \\ -(-4x^2-4x) & \\ -4x-4 & \\ -\ 4x+4 & \\ 0 & \end{array}$$

$= x^2-4x-12=0$

$(x-6)(x+2)=0$

$x=+2,\ x=-\frac{2}{3}$

$D_f = \mathbb{R} - \{-1, 2, -\frac{2}{3}\}$

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الف) $x-\sqrt{3-2x} \neq 0 \rightarrow x \neq \sqrt{3-2x} \rightarrow x^2 \neq 3-2x \rightarrow x^2+2x-3 \neq 0 \rightsquigarrow (x+3)(x-1) \neq 0$

$x \neq -3, +1$

$\hookleftarrow$ قق ق

$3-2x \geq 0 \rightsquigarrow -2x \geq -3 \rightarrow 2x \leq 3 \rightsquigarrow x \leq \frac{3}{2}$

$D_f = (-\infty, \frac{3}{2}] - \{+1\}$

ب) $x-\sqrt{3x-2} \neq 0 \rightsquigarrow x \neq \sqrt{3x-2} \rightsquigarrow x^2 \neq 3x-2 \rightsquigarrow x^2-3x+2 \neq 0 \rightsquigarrow (x-1)(x-2) \neq 0$

$x \neq 1, 2$

$3x-2 \geq 0 \rightsquigarrow 3x \geq 2 \rightsquigarrow x \geq \frac{2}{3}$ $D_f = [\frac{2}{3}, +\infty) - \{1, 2\}$

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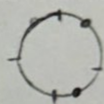
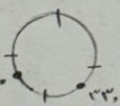
الف) $2\cos x - 1 \neq 0 \rightsquigarrow 2\cos x \neq 1 \rightsquigarrow \cos x \neq \frac{1}{2}$ $x \neq 60°, 120°$



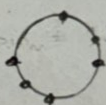
$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}\}$

ب) $2\sin x + 1 \neq 0 \rightsquigarrow 2\sin x \neq -1 \rightsquigarrow \sin x \neq -\frac{1}{2}$



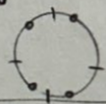
$D_f = \mathbb{R} - \{2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6}\}$

ج) $\tan = \frac{\sin}{\cos} \rightsquigarrow \cos \neq 0$ $\cot x \neq 1 \rightsquigarrow x \neq 45°, 225°$



$D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}, k\pi + \frac{\pi}{4}, k\pi\}$ $\cot = \frac{\cos}{\sin} \rightarrow \sin \neq 0$

د) $4\sin^2 x \neq 3 \rightsquigarrow \sin^2 x \neq \frac{3}{4} \rightsquigarrow \sin x \neq \pm\frac{\sqrt{3}}{2}$



$D_f = \mathbb{R} - \{k\pi + \frac{\pi}{3}, k\pi + \frac{2\pi}{3}\} \doteq \mathbb{R} - \{k\pi \pm \frac{\pi}{3}\}$

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الف) $x^2-5x+6 > 0 \rightsquigarrow (x-2)(x-3) > 0$

$2 \quad 3$

$+ \quad - \quad +$

$D_f = (3, +\infty) \cup (-\infty, 2)$

ب) $x^2-6x+5 < 0 \rightsquigarrow (x-5)(x-1) < 0$

$1 \quad 5$

$+ \quad - \quad +$

$D_f = (1, 5)$

ج) $x^2+6x+5 \geq 0 \rightsquigarrow (x+1)(x+5) \geq 0$

$-5 \quad -1$

$+ \quad - \quad +$

$\rightsquigarrow D_f = [-1, +\infty) \cup (-\infty, -5]$

د) $x^2-7x+6 \leq 0 \rightsquigarrow (x-1)(x-6) \leq 0$

$1 \quad 6$

$+ \quad - \quad +$

$D_f = [1, 6]$

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الف) $\dfrac{(x-1)(x-2)}{(x-5)} < 0$

$1 \quad 2 \quad 5$

$- \quad + \quad - \quad +$

$\rightsquigarrow D_f = (-\infty, 1) \cup (2, 5)$

ب) $\dfrac{(x+1)(x-1)}{(x-5)(x-1)} \geq 0$

$-1 \quad 1 \quad 5$

$+ \quad - \quad - \quad +$

$\rightsquigarrow D_f = (5, +\infty) \cup (-\infty, -1]$

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

$1 \quad 3$: $- \circ - \bullet +$

$D_f=[3,+\infty)$

$\Delta<0 \Rightarrow$ همواره $(+)$

ب) $x^2-1\neq 0 \Rightarrow (x+1)(x-1)\neq 0 \quad x\neq \pm 1 \quad D_f=\mathbb{R}-\{\pm 1\}$

الف) $x^2-3x>0 \Rightarrow x(x-3)>0$ 7

$0 \quad 3$: $+ \circ - \circ +$

$D_f=(3,+\infty)\cup(-\infty,0)$

ب) $16-x^2>0 \Rightarrow x^2<16 \Rightarrow -4<x<4$ (I)

$|x|-2>0 \Rightarrow |x|>2 \Rightarrow x>2,\ x<-2$ (II)

$|x|-2\neq 1$

$|x|\neq 3 \rightarrow x\neq \pm 3$ (III)

$D_f=(2,4)\cup(-4,-2)-\{\pm 3\}$

ج) $\frac{x^2-7x+12}{x-3}>0 \quad \frac{(x-3)(x-4)}{(x-3)}>0$

$3 \quad 4$: $- \circ - \circ +$ $\Rightarrow (4,+\infty)$

$D_f=(4,10)-\{9\}$

$10-x>0 \Rightarrow x<10 \qquad 10-x\neq 1 \Rightarrow -x\neq -9 \Rightarrow x\neq 9$

د) $x^2-11x+28\geq 0 \Rightarrow (x-4)(x-7)\geq 0$

$4 \quad 7$: $+ \bullet - \bullet +$ $\Rightarrow [7,+\infty)\cup(-\infty,4]$

$D_f=(0,4]-\{1\}$

$x\neq 1 \quad x>0 \quad 36-x^2>0 \Rightarrow x^2<36 \Rightarrow -6<x<+6$

$y=\frac{x(x-1)}{x(x+1)}$ 8

سریع

$-1 \quad 0 \quad +1$: $+ \circ \circ - \bullet +$

آپارتمانی:

	-1		0		$+1$	
x^2-x	+		+	$\bullet$ −	$\bullet$	+
x^2+x	+	$\circ$	−	$\circ$ +		+
$P(x)$	+	$\circ$	$\circ$ −		$\bullet$	+

روش سریع: $x=f(x) \Rightarrow x=3,-1$ 9

$f(x)=0 \quad x\neq \pm 2$

$-2 \quad -1 \quad 2 \quad 3$: $- \circ + \mid - \circ + \mid -$

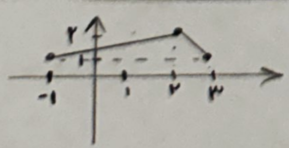
$D_f=(-2,-1]\cup(2,3]$

$f(x)\neq 0 \Rightarrow x=\pm 2$

$\frac{x-f(x)}{f(x)}\geq 0$

	-2	-1	2	3	
$x-f(x)$	−	− $\bullet$	+	+ $\bullet$	−
$f(x)$	+ $\circ$	−	− $\circ$	+	+
$P(x)$	− $\circ$	+	− $\circ$	+	−

الف) 10



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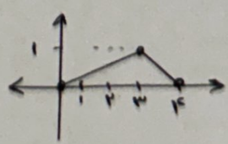

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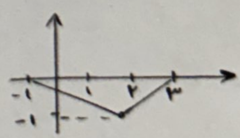

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