حسین نژادکرد - تکلیف شماره ۶ - دهم پسران ۸

۱-

الف) $\dfrac{x+4}{(x-1)(4x^2-16x+15)} \Rightarrow (x-1)(4x^2-16x+15) \neq 0$

$\Rightarrow x \neq 1 \ ,\ \dfrac{x^2-16+60}{(x-10)(x-6)}$

$\Rightarrow D_f = R - \{1 , 2/5 , 1/5\}$

ب) $\dfrac{x+3}{(x+1)(3x^2-4x-4)} \Rightarrow (x+1)(3x^2-4x-4) \neq 0$

$\Rightarrow x \neq -1 \ ,\ \dfrac{x^2-4x-12}{(x-6)(x+2)}$

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

۲-

الف) $3-2x \geqslant 0 \Rightarrow 3 \geqslant 2x \Rightarrow 1/5 \geqslant x$

$x - \sqrt{3-2x} \neq 0 \Rightarrow x \neq \sqrt{3-2x} \Rightarrow x^2 \neq 3-2x$

$\Rightarrow x^2+2x-3 \neq 0 \Rightarrow x \neq 1 \ ,\ x \neq -3$

$\Rightarrow D_f = (-\infty , 1/5] - \{1 , -3\}$

ب) $3x-2 \geqslant 0 \Rightarrow 3x \geqslant 2 \Rightarrow x \geqslant \frac{2}{3}$

$x - \sqrt{3x-2} \neq 0 \Rightarrow x \neq \sqrt{3x-2} \Rightarrow x^2 \neq 3x-2$

$\Rightarrow x^2-3x+2 \neq 0 \Rightarrow x \neq 1 \ ,\ x \neq 2$

$\Rightarrow D_f = [\frac{2}{3} , \infty) - \{1 , 2\}$

۳-

الف) $2\cos x - 1 \neq 0 \Rightarrow 2\cos x \neq 1 \Rightarrow \cos x \neq 0/5$

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

ب) $2\sin x+1\neq 0 \Rightarrow 2\sin x\neq -1 \Rightarrow \sin x\neq -0/5$

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

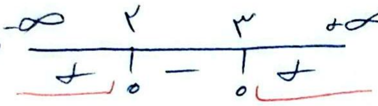
ج) $\cot x-1\neq 0 \Rightarrow \cot x\neq 1 \Rightarrow x\neq k\pi+\frac{\pi}{4}$

$\sin x\neq 0 \Rightarrow x\neq k\pi$ و $\cos x\neq 0 \Rightarrow x\neq k\pi+\frac{\pi}{2}$

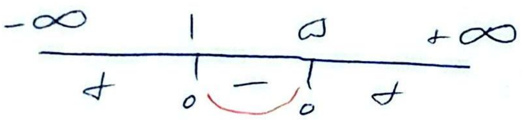
$\Rightarrow D_f=\mathbb{R}-\{k\pi, k\pi+\frac{\pi}{4}, k\pi+\frac{\pi}{2}\} \Rightarrow D_f=\mathbb{R}-\{\frac{k\pi}{2}, k\pi+\frac{\pi}{4}\}$

د) $4\sin^2 x-3\neq 0 \Rightarrow 4\sin^2 x\neq 3 \Rightarrow \sin^2 x\neq \frac{3}{4} \Rightarrow \sin x\neq \pm\frac{\sqrt{3}}{2}$

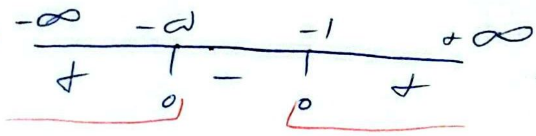
$\Rightarrow x\neq k\pi+\frac{\pi}{3}$ و $k\pi+\frac{2\pi}{3} \Rightarrow D_f=\mathbb{R}-\{k\pi+\frac{\pi}{3}, k\pi+\frac{2\pi}{3}\}$

۴- الف) $(x-2)(x-3) \longrightarrow$ 

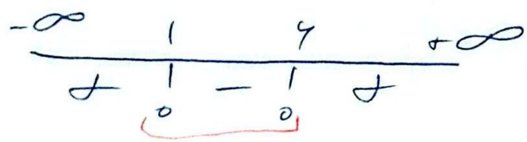
$\Rightarrow D_f=(-\infty, 2)\cup(3, +\infty)$

ب) ریشه‌ها $1, 5 \longrightarrow$ 

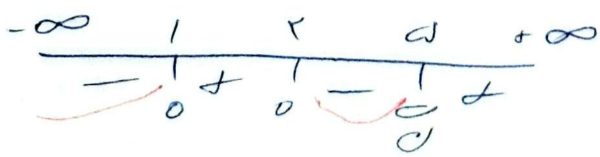
$\Rightarrow D_f=(1, 5)$

ج) ریشه‌ها $-1, -5 \longrightarrow$ 

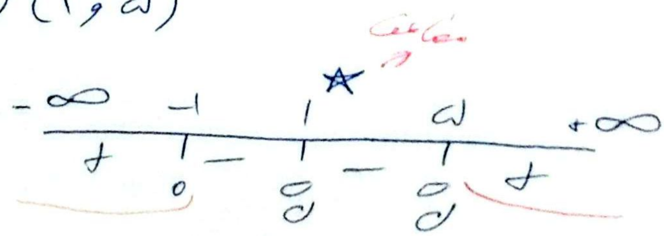
$\Rightarrow D_f=(-\infty, -5]\cup[-1, \infty)$

د) ریشه‌ها $1, 6 \longrightarrow$ 

$\Rightarrow D_f=[1, 6]$

۵- الف) ریشه‌ها $5, 1, 2 \longrightarrow$ 

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

ب) ریشه‌ها $\pm 1, 1, 5 \longrightarrow$ 

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

۶-

ب) $\frac{x^2-4x+3}{x^3-1}\geq 0 \Rightarrow \frac{x^2-4x+3}{(x-1)(x^2+x+1)}\geq 0$ → 1، 3 ; → 1 ریشه

$-\infty$		1^{*}		3		$+\infty$
	$-$	ت	$-$	0	$+$	

$\Rightarrow D_f=[3,+\infty)$

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

۷-

الف) $x^2-3x>0 \Rightarrow x\neq 0,3 \Rightarrow D_f=\mathbb{R}-\{0,3\}$

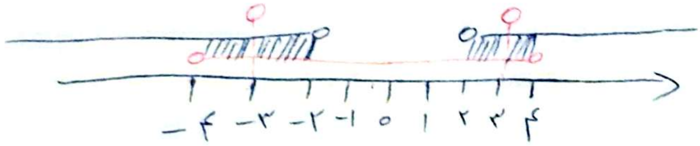
ب) $16-x^2>0 \Rightarrow$

$-\infty$		-4		4		$+\infty$
	$-$	0	$+$	0	$-$	

$\rightarrow x=(-4,4)$

$|x|-2>0 \Rightarrow |x|>2 \Rightarrow x>2$ یا $x<-2 \rightarrow x=(-\infty,-2)\cup(2,\infty)$

$|x|-2\neq 1 \Rightarrow |x|\neq 3 \Rightarrow x\neq \pm 3$



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

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

$-\infty$		3^{*}		4		$+\infty$
	$-$	ت	$-$	0	$+$	

$\rightarrow x=(4,+\infty)$

$10-x>0 \Rightarrow 10>x$

$10-x\neq 1 \Rightarrow -x\neq -9 \Rightarrow x\neq 9$

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

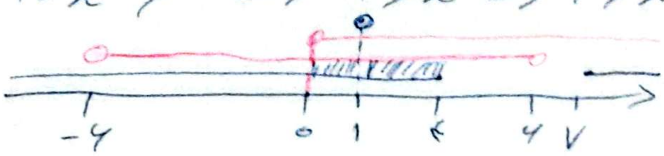
د) $x^2-11x+28\geq 0 \Rightarrow$

$-\infty$		4		7		$+\infty$
	$+$	0	$-$	0	$+$	

$\rightarrow x=(-\infty,4]\cup[7,\infty)$

$\sqrt{36-x^2}>0 \Rightarrow 36-x^2>0 \Rightarrow 36>x^2 \Rightarrow 6>x>-6$

$x>0\ ,\ x\neq 1 \Rightarrow$



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

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$$y = \frac{x^2 - x}{x^2 + x}$$

ریشه ها ← ۰ و ۱

ریشه ها ← ۰ و ۱-

		-1	0	1
$x^2 - x$	+	+	−	+
$x^2 + x$	+	−	+	+
$f(x)$	+	−	−	+

$-\infty$ -1 0 ★ 1 $+\infty$

+   ∅   −   ∅   −   0   +

۹ـ

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

ریشه ها ← ۳ و ۱-

ریشه ها ← ۲ و ۲-

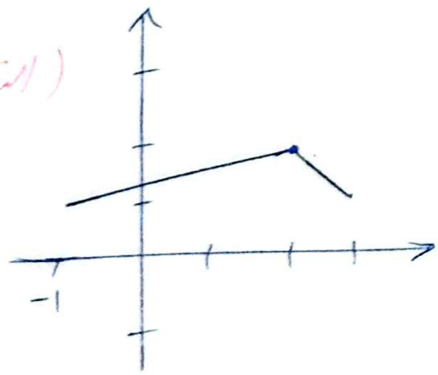
$-\infty$ -2 -1 2 3 $+\infty$

−   0   +   0   −   0   +   0   −

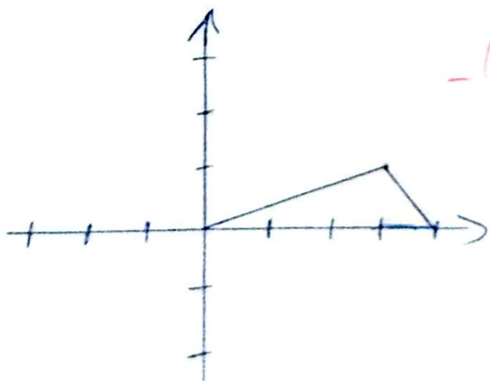
$$\Rightarrow D_f = [-2, -1] \cup [2, 3]$$

۱۰ـ

الف)



ب)



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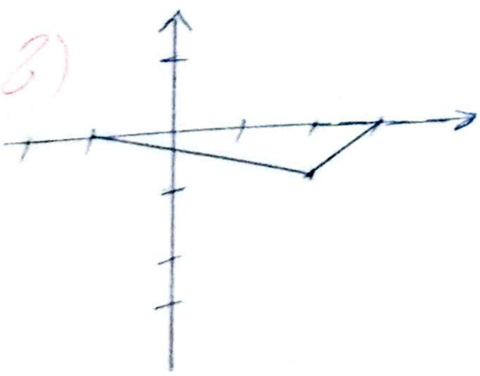

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