ستاره لیلی پورحسینی — تکلیف سری ۶ — کلاس دهم ریاضی B

Year Month Date ( )

①

الف) جمع ضرایب = ۰ ⟵ مخرج

$$4x^3-20x^2+31x-15 \;\big|\; x-1 \rightarrow x=1$$

$$(4x^2-16x+15) \rightarrow (2x-5)(2x-3) \quad x=\frac{5}{2} \quad x=\frac{3}{2}$$

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

ب) در مخرج جمع ضرایب توان‌های زوج = در مخرج جمع ضرایب توان‌های فرد ⟸ بر $(x+1)$ بخش‌پذیر است

$$3x^3-x^2-8x-4 \;\big|\; x+1 \quad 3x^2-4x-4$$

$$(x+1)(3x^2-4x-4) \rightarrow x=-1$$

$$(x^2-4x-12) \rightarrow (x-6)(x+2) \quad x=\frac{6}{3} \quad x=-\frac{2}{3}$$

$$D_f=\mathbb{R}-\left\{-1,\frac{6}{3},-\frac{2}{3}\right\}$$

②

الف) $\dfrac{x+1}{x-\sqrt{3-2x}} \Rightarrow I \cap II \rightarrow D_f=(-\infty,1/5]-\{1\}$

$3-2x\geq 0 \rightarrow 2x\leq 3 \rightarrow x\leq \frac{3}{2}=1/5 \quad I$

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

$x=-3$ / $x=1$ جواب نیست

ب) $y=\dfrac{x+3}{x-\sqrt{3x-2}} \Rightarrow I\cap II \rightarrow D_f=\left[\frac{2}{3},+\infty\right)-\{1,2\}$

$3x-2\geq 0 \rightarrow 3x\geq 2 \rightarrow x\geq\frac{2}{3}$ I $,\; x-\sqrt{3x-2}\neq 0 \rightarrow x\neq\sqrt{3x-2} \rightarrow x^2\neq 3x-2$

$x^2-3x+2\neq 0 \rightarrow (x-1)(x-2)\neq 0$ II $\quad x=1 \quad x=2$

③

الف) $y=\dfrac{\sin x}{2\cos x-1} \rightarrow 2\cos x-1\neq 0 \rightarrow \cos x\neq\frac{1}{2}$ $x=60^\circ$, $x=300^\circ$ $\quad D_f=\mathbb{R}-\left\{2k\pi+\frac{\pi}{3},2k\pi-\frac{\pi}{3}\right\}$

ب) $y=\dfrac{\cos x+1}{2\sin x+1} \quad 2\sin x+1\neq 0 \rightarrow \sin x\neq -\frac{1}{2}$ $x=330^\circ$, $x=210^\circ$ $\quad D_f=\mathbb{R}-\left\{2k\pi+\frac{\pi}{3},2k\pi+\frac{5\pi}{3}\right\}$

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

ج) $y=\dfrac{\tan x+2}{\cot x-1} \rightarrow \cot x-1\neq 0 \rightarrow \cot x\neq 1$ $x=45^\circ$, $x=225^\circ$ $\quad \cos x\neq 0 \rightarrow 90^\circ, 270^\circ$ $\quad \sin x\neq 0 \rightarrow$ صفر, 180°, 360°

$\cot=\frac{\cos}{\sin} \qquad D_f=\mathbb{R}-\left\{\frac{k\pi}{2},\;k\pi+\frac{\pi}{4}\right\}$

د) $y=\dfrac{\sin x+1}{4\sin^2x-3} \quad 4\sin^2x-3\neq 0 \rightarrow \sin^2x\neq\frac{3}{4} \rightarrow \sin x\neq\pm\frac{\sqrt{3}}{2} \rightarrow 60^\circ,120^\circ,240^\circ,300^\circ$

$D_f=\mathbb{R}-\left\{k\pi+\frac{\pi}{3},\;k\pi-\frac{\pi}{3}\right\}$

④

الف) $x^2-5x+6>0 \rightarrow (x-2)(x-3)>0 \rightarrow$ $+\;2\;-\;3\;+$ $\rightarrow = (-\infty,2)\cup(3,+\infty)$

ب) $x^2-6x+5<0 \rightarrow (x-1)(x-5)<0 \rightarrow$ $+\;1\;-\;5\;+$ $\rightarrow = (1,5)$

ج) $x^2+6x+5\geq 0 \rightarrow (x+1)(x+5)\geq 0 \rightarrow$ $+\;-5\;-\;-1\;+$ $\rightarrow = (-\infty,-5]\cup[-1,+\infty)$

د) $x^2-7x+6\leq 0 \rightarrow (x-1)(x-6)\leq 0 \rightarrow$ $+\;1\;-\;6\;+$ $\rightarrow = [1,6]$

Parsian

(۵)

الف) $\frac{x^2-3x+2}{x-5}<0 \to \frac{(x-1)(x-2)}{x-5}<0$
$-\overset{1}{\circ}+\overset{2}{\circ}-\overset{5}{\circ}+$
$=(-\infty,1)\cup(2,5)$

ب) $\frac{x^2-1}{x^2-6x+5}\geq 0 \to \frac{(x-1)(x+1)}{(x-1)(x-5)}\geq 0$
$+\overset{-1}{\circ}-\overset{1}{\circ}-\overset{5}{\circ}+$
$\to (-\infty,-1]\cup(5,+\infty)$

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(۶)

الف) $y=\sqrt{\frac{x^2-4x+3}{x^3-1}} \to \frac{x^2-4x+3}{x^3-1}\geq 0 \to \frac{(x-1)(x-3)}{x^3-1}\geq 0$
$-\overset{1}{\circ}-\overset{3}{\circ}+$

$D_f=[3,+\infty)$

ب) $\sqrt[3]{\frac{x^2-4x+3}{x^2-1}}$
چون فرجه فردی باشد پس فقط کافی است مخرج مخالف صفر باشد.
$\to x^2-1\neq 0 \to x^2\neq 1 \to x\neq \pm 1$
$D_f=\mathbb{R}-\{\pm 1\}$

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(۷)

الف) $y=\log(x^2-3x)$
$x^2-3x>0$
$x(x-3)$
$+\overset{0}{\circ}-\overset{3}{\circ}+ \to D_f=(-\infty,0)\cup(3,+\infty)$

ب) $y=\log_{|x|-2}(16-x^2)$
$16-x^2>0 \to (4-x)(4+x)>0$
$-\overset{-4}{\circ}+\overset{4}{\circ}- \to (-4,4)$ I
$|x|-2>0 \to 2<|x| \to x>2,\ x<-2 \to (-\infty,-2)\cup(2,+\infty)$ II
$|x|-2\neq 1 \to |x|\neq 3 \to x\neq \pm 3$ III
$I\cap II\cap III \to D_f=(-4,-2)-\{-3\}\cup(2,4)-\{3\}$

ج) $y=\log_{10-x}\frac{x^2-7x+12}{x-3}$
$\frac{(x-3)(x-4)}{x-3}>0$
$-\overset{3}{\circ}-\overset{4}{\circ}+ \to (4,+\infty)$ I
$10-x>0 \to x<10$ II
$10-x\neq 1 \to x\neq 9$ III
$\Rightarrow I\cap II\cap III$
$D_f=(4,10)-\{9\}$

د) $y=\sqrt{x^2-11x+28}+\log_x\sqrt{36-x^2}$
$36-x^2>0 \to (6-x)(6+x)>0$
$-\overset{-6}{\circ}+\overset{6}{\circ}- \to (-6,6)$ II
$\to x>0,\ x\neq 1$ III
$(x-7)(x-4)\geq 0$
$+\overset{4}{\circ}-\overset{7}{\circ}+$
$(-\infty,4]\cup[7,+\infty)$ I
$I\cap II\cap III \to D_f=(0,4]-\{1\}$

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(۸)

$y=\frac{x^2-x}{x^2+x}$ $\xrightarrow{\text{تجزیه}}$ $\frac{x(x-1)}{x(x+1)}$
$+\overset{-1}{\circ}-\overset{0}{\circ}-\overset{1}{\circ}+$

		−1		0		1	
x^2-x	+		+	0	−	0	+
x^2+x	+	0	−	0	+		+
	+	○	−	○	−		+

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(۹)

$y=\sqrt{\frac{x-f(x)}{f(x)}} \to \frac{x-f(x)}{f(x)}\geq 0$
$-\overset{-2}{\circ}+\overset{-1}{\circ}-\overset{2}{\circ}+\overset{3}{\circ}-$
$x-f(x)=0$
$x=f(x) \to x=3,-1$ ، $f(x)=0 \to x=2,-2$
$D_f=(-2,-1]\cup(2,3]$

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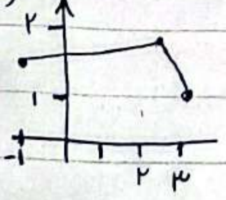
(۱۰)

الف)



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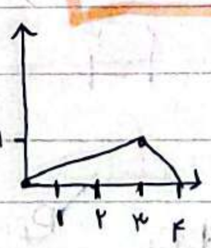

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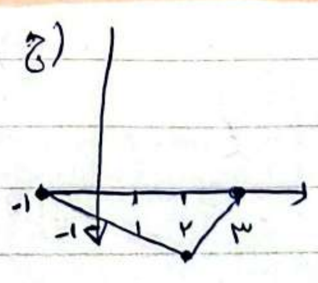

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