۱۸/۵

نام و نام خانوادگی امیرپناه .... پاسخنامه تشریحی تکلیف شماره ۶ کلاس شنبه‌ها ....

۱ (۲)

$y = \dfrac{x+4}{4x^3 - 20x^2 + 31x - 15}$

جمع ضرایب صفر پس بر $x-1$ بخش‌پذیر

$4x^3 - 20x^2 + 31x - 15 \mid x-1 \quad \to \quad 4x^2 - 16x + 15$

$(2x-5)(2x-3) \quad \frac{5}{2}, \ \frac{3}{2}$

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

$y = \dfrac{x+3}{3x^3 - x^2 - 8x - 4}$

ضرایب زوج با فرد برابر

$3x^3 - x^2 - 8x - 4 \mid x+1 \quad \to \quad 3x^2 - 4x - 4 \to (x-2)(3x+2)$

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

۲ (۱/۷۵)

$y = \dfrac{x+1}{x - \sqrt{3-2x}} \Rightarrow x - \sqrt{3-2x} \neq 0 \Rightarrow x \neq \sqrt{3-2x} \quad x^2 \neq 3 - 2x$

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

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

-3 زائد — $x = -3 \quad y = \frac{-2}{-6}$

$y = \dfrac{x+2}{x - \sqrt{3x-2}} \quad x - \sqrt{3x-2} \neq 0 \to x^2 \neq 3x - 2 \to x^2 - 3x + 2 \neq 0 \to (x-1)(x-2)$

$D = [\frac{2}{3}, +\infty) - \{1, 2\}$

۳ (۱/۷۵)

الف) $y = \dfrac{\sin x}{2\cos x - 1} \quad 2\cos x - 1 \neq 0 \quad 2\cos x \neq 1 \quad \cos x = \frac{1}{2} \quad \pm\frac{\pi}{3} + 2k\pi$

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

ب) $y = \dfrac{\cos x + 1}{2\sin x + 1} \quad 2\sin x + 1 \neq 0 \Rightarrow 2\sin x = -1 \quad \sin x \neq -\frac{1}{2}$

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

ج) $y = \dfrac{\tan x + 2}{\cot x - 1} \neq 0 \quad \cot x \neq 1$

$D = \mathbb{R} - \{k\pi, \frac{\pi}{4}\}$

د) $y = \dfrac{\sin x + 1}{4\sin^2 x - 3} \quad 4\sin^2 x - 3 \neq 0 \quad \sin^2 x \neq \frac{3}{4} \quad \sin x \neq \frac{\sqrt{3}}{2}$

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

۴ (۲)

$x^2 - 5x + 6 > 0 \quad (x-2)(x-3) > 0 \qquad D = (-\infty, 2) \cup (3, +\infty)$

$x^2 - 6x + 5 < 0 \quad (x-5)(x-1) < 0 \qquad D = (1, 5)$

$x^2 + 6x + 5 \geq 0 \to (x+1)(x+5) \geq 0 \qquad D = (-\infty, -5] \cup [-1, +\infty)$

$x^2 - 7x + 6 \leq 0 \to (x-1)(x-6) \leq 0 \qquad D = [1, 6]$

۵ (۲)

$\dfrac{x^2 - 3x + 2}{x - 5} < 0 \quad \dfrac{(x-1)(x-2)}{(x-5)} < 0 \qquad D = (-\infty, 1) \cup (2, 5)$

$\dfrac{x^2 - 1}{x^2 - 6x + 5} \geq 0 \quad \dfrac{(x+1)(x-1)}{(x-1)(x-5)} \geq 0 \qquad D = (-\infty, -1] \cup (5, +\infty)$

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

$-1 \quad 1 \quad 3$: $- \varnothing - \varnothing - \varnothing +$ $\quad D=[3,+\infty)$

۲

$y = \sqrt[3]{\frac{x^2-4x+3}{x^2-1}} \to \frac{x^2-4x+3}{x^2+1} \to x^2-1 \neq 0 \quad x \neq 1$

$D = \mathbb{R} - \{1,-1\}$

الف) $y = \log^{x^2-3x}$ $\quad x^2-3x>0 \quad x(x-3)>0 \quad D=(-\infty,0)\cup(3,\infty)$

ب) $y = \log_{|x|-2}^{16-x^2}$ $\quad 16-x^2>0$ $\quad$ $x>3$, $x<0$ $\quad D=(-4,-3)\cup(2,4)-\{\pm 3\}$ ۷

$-4<x<4 \quad |x|-2>0 \Rightarrow |x|>2 \Rightarrow x>2$ یا $x<-2$

ج) $y = \log_{10-x} \frac{x^2-7x+12}{x-3} \to \frac{(x-3)(x-4)}{x-3}$ $\quad$ $3^{*} \quad 4$: $- - \varnothing +$ $\quad x>4$

$D=(4,10)-\{9\}$ $\quad x \leq 4$ یا $x \geq 7$ $\quad D=(0,1)\cup[4,7]$

د) قطع جواب وطل $\quad x^2-11x+28 \geq 0 \Rightarrow (x-7)(x-4) \geq 0 \quad x \neq 1, x>0$

۳

$y = \frac{x^2-x}{x^2+x} = \frac{x(x-1)}{x(x+1)}$

روش ساده: $-1 \quad {*}1$: $+ | - | - \varnothing +$ (قبول)

روش آپارتمانی

x		-1		0		1	
x^2-x	$+$		$+$	$\varnothing$	$-$	$\varnothing$	$+$
x^2+x	$-$	$\varnothing$	$+$	$\varnothing$	$-$		$-$
		$+$		$+$		$+$	$-$

$D = \mathbb{R} - \{0,-1\}$ ۸

۱

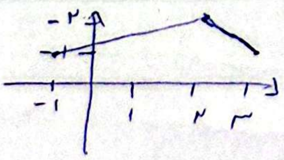
$y = \sqrt{\frac{x-f(x)}{f(x)}}$ $\quad$ $-2 \quad -1 \quad 2 \quad 3$: $- | + \varnothing - | + \varnothing -$ $\to D = (-2,-1] \cup [-2,-1]$

$-2, 2$ ریشه $\quad \cup (2,3]$ ۹

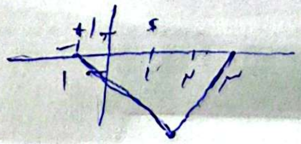
$\frac{x-f(x)}{f(x)} \geq 0 \quad f(x) \neq 0$

۲

$f(x)+1$



$-f(x)$



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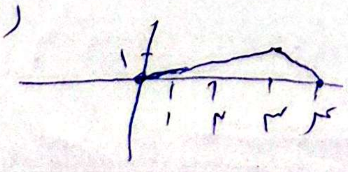
۱۰

$f(x-1)$



$f(x+1)+2$