(ریما صادقی)

۸)

الف) $x^2+\frac{1}{x^2+3} \to t+\frac{1}{t+3} = t = x^2 \geq 0$

$t \geq 0$ $\qquad 0+\frac{1}{3}=\frac{1}{3}$

$R=[\frac{1}{3}, +\infty)$

ب) $\frac{x^2+5}{\sqrt{x^2+4}} \to \sqrt{x^2+4}+\frac{1}{\sqrt{x^2+4}} \geq 2$ $\qquad 2+\frac{1}{2}=\frac{5}{2}$

$R=[\frac{5}{2}, +\infty)$

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۹)

$y=|x-3|+|3x+4|$

$3x+4=0$ $\quad 3x=-4$ $\quad x=-\frac{4}{3}$

$-\frac{4}{3}$		3	
$x-3<0$ $-x+3$ $3x+4<0$ $-3x-4$ $-4x-1$	$3x+4\geq 0$ $3x+4$ $x-3<0$ $-x+3$ $2x+7$		$3x+4\geq 0$ $x-3\geq 0$ $4x+1$

$R=[\frac{13}{3}, +\infty)$

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۱۰)

الف) $=|x-2|+|2x+2|$

$x=2$ $\qquad x=-1$

$(-\infty, -1)$	$[-1, 2)$	$[2, +\infty)$
$x-2<0$ $\|x-2\|=-x+2$ $2x+2<0$ $-2x-2$ $-3x$	$x-2<0$ $-x+2$ $2x+2$ $x+4$	$x-2$ $2x+2$ } $3x$

$R=[3, +\infty)$

ب) $=|2x-2|-|x+1|=$

$x+1=0$
$x=-1$

$2x-2\geq 0$
$2x\geq 2$
$x=1$

$(-\infty, -1)$	-1 $[-1, 1)$	1 $[1, +\infty)$
$2x-2<0$ $-2x+2-(-x-1)$ $\|x+1\|\geq 0$ $\quad x\geq -1$ $\quad -x-1$ $-2x+2+x+1$ $-x+3$	$2x-2<0$ $-2x+2$ $x+1\geq 0$ $x+1$ $-3x+1$	$2x-2\geq 0 \to 2x-2$ $x+1\geq 0 \to \|x+1\|=x+1$ $x-3$

$R=[-2, +\infty)$

درسا صادقی

۴)

الف) $y = \frac{3x+1}{x-2} \longrightarrow R = \mathbb{R} - \{3\}$

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

ب) $\frac{2x+1}{x+1} \longrightarrow \frac{2}{1} = 2 \longrightarrow R = \mathbb{R} - \{2\}$

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۵)

الف) $\sqrt{\frac{4x+4}{x+1}} \geq 0 \qquad R = [0,+\infty) - \{\sqrt{4}\}$

$\frac{4}{1} = 4 \longrightarrow \sqrt{4}$

ب) $\sqrt{\frac{3x+1}{2-x}} \geq 0 \longrightarrow R = [0,+\infty$

$\frac{3}{-1} = -3 \rightarrow \sqrt{-3} \rightarrow$ تعریف نشده

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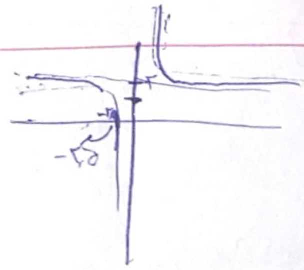
۶)

$y = \frac{2x-3}{x+1} \qquad \frac{2}{1} = 2 \qquad R = \mathbb{R} - \{2\}$



$y = \frac{2x-1}{x+2} \qquad R = \mathbb{R} - \{2\}$

$\frac{2}{1} = 2$

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۷)

الف) $\sin x + \frac{1}{\sin x} \longrightarrow \sin \neq 0 \longrightarrow R = (-\infty,-2] \cup [2,+\infty)$

$\sin x = [-1,1] - \{0\}$

$-1+-1=-2 \leftarrow -1 = \sin x$

$1+1=2 \leftarrow 1 = \sin x$

ب) $\frac{x^4+1}{x^2} \rightarrow x^2 + \frac{1}{x^2} \longrightarrow R = \mathbb{R}$

ج) $\frac{\sqrt[3]{x^2+1}}{\sqrt[3]{x}} \longrightarrow \sqrt[3]{x} + \frac{1}{\sqrt[3]{x}} \qquad R = (-\infty,-2] \cup [2,+\infty)$

$x \neq 0$

د) $\sqrt{x} + \frac{1}{\sqrt{x}} \rightarrow x \geq 0$ (1) $\longrightarrow \frac{1}{\sqrt{x}} \rightarrow [2,+\infty) = R$

$x \neq 0$ (2)

$\xrightarrow{(1),(2)} x > 0$

درسا صادقی

۱

الف) $y = x^3 - 3x^2 + 3x \longrightarrow \underbrace{(x-1)^3}_{R_f = \mathbb{R}} + 1$

ب) $y = \dfrac{1}{x^2 - 2x}$

$\dfrac{1}{x(x-2)}$. $x^2 - 2x = x(x-2)$

$x \neq 2, 0$. $x^2 - 2x = (x-1)^2 - 1$

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

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۲) الف) $x^2 - 4x + 10$ $f(2) = 2^2 - 4\times2 + 10 = 4 - 8 + 10 = 6$

$x = -\dfrac{b}{2a} = \dfrac{4}{2} = 2$ $R = [6, +\infty)$

ب) $-x^2 + 6x + 3$ $x = \dfrac{-b}{2a} = \dfrac{-6}{2(-1)} = 3$

y جایگذاری $= -(3^2) + (6\times3) + 3 = -9 + 18 + 3 = 12 \longrightarrow R = (-\infty, 12]$

ج) $\sqrt{x^2 - 4x - 3} \geq 0$ $R = [0, +\infty)$

$2 \pm \sqrt{7}$ ریشه‌ها

د) $\sqrt{6x - x^2} \geq 0$

$x(6-x) \longrightarrow 9 - (x-3)^2 \longrightarrow \sqrt{9} = 3$

$R = [0, 3]$

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۳)

$y = x^3 - 5x^2 + 2x + 1 \longrightarrow R_f = \mathbb{R}$

$y = x^7 - 6x^4 + 3x + 2 \longrightarrow R_f = \mathbb{R}$

$y = \sqrt{x^4 - 4x^3 + 5x + 1} \longrightarrow R = [0, +\infty)$

$y = (x^5 - 4x^2 + 3x + 1)^2$ $R = [0, +\infty)$

چون به توان زوج است همیشه مثبت