دریا ریانی

(9)

Subject :
Year . Month . Date . ( )

1 –

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

$yx^2 - 2xy = 1$

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

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

$x - 1 = \sqrt{\frac{1+y}{y}} \rightarrow x = \sqrt{\frac{1+y}{y}} + 1 \Rightarrow R_f = (-\infty \ -1] \cup (0, \infty)$

	-1		0	
$+$		$-$		$+$

$y = x^3 - 3x^2 + 3x$

$x^3 - 3x^2 + 3x + 1 - 1 = (x-1)^3 + 1 = y$

$(x-1)^3 = y - 1 \rightarrow x - 1 = \sqrt[3]{y-1}$

$x = \sqrt[3]{y-1} + 1 \rightarrow R_f = \mathbb{R}$

2 –

الف) $y = x^2 - 4x + 10$

ext (min) $\left| \frac{-b}{2a} = \frac{4}{2} = 2 \right.$; $(2)^2 - 4(2) + 10 = 6$ $\quad R_f = [6 \ +\infty)$

ب) $y = -x^2 + 6x + 3$

ext (max) $\left| \frac{-6}{-2} = 3 \right.$; $-(3)^2 + 6(3) + 3 = 12$ $\quad R_f = (-\infty \ 12]$

ج) $y = \sqrt{x^2 - 4x - 3}$

ext $\left| \frac{-b}{2a} = \frac{4}{2} = 2 \right.$; $4 - 8 - 3 = -7$ $\quad \sqrt{[-7 \ +\infty)} \downarrow R_f = [0 \ +\infty)$

د) $y = \sqrt{+6x - x^2}$

ext $\left| \frac{-6}{-2} = 3 \right.$; $18 - 9 = 9$ $\quad \sqrt{(-\infty \ 9]} \rightarrow [0 \ 3]$ $\quad R_f = [0 \ 3]$

3 –

الف) $y = x^3 - 5x^2 + 3x + 1$

$R_f = R$

ب) $x^7 - 6x^4 + 3x + 2$

$R_f = \mathbb{R}$

ج) $y = \sqrt{x^7 - 6x^3 + 5x + 1}$

$R_f = [0 \ +\infty)$

د) $(x^5 - 4x^3 + 3x + 1)^2$ (همواره مثبت)

$R_f = [0 \ +\infty)$

4 –

الف) $y = \frac{3x+1}{x-2} \rightarrow \frac{ax+b}{cx+d}$

$R_f = \mathbb{R} - \{\frac{3}{1}\} = \mathbb{R} - \{3\}$

ب) $y = \frac{2x+1}{x+1}$

$R_f = \mathbb{R} - \{2\}$

5 –

الف) $y = \sqrt{\frac{2x+4}{x+1}}$

$\sqrt{\mathbb{R} - \{2\}} = R_f = [0 \ +\infty) - \{\sqrt{2}\}$

ب) $y = \sqrt{\frac{3x+1}{2-x}} \Rightarrow \sqrt{\frac{3x+1}{-x+2}}$

$\sqrt{\mathbb{R} - \{-3\}} \rightarrow R_f = [0 \ +\infty)$

PAPCO

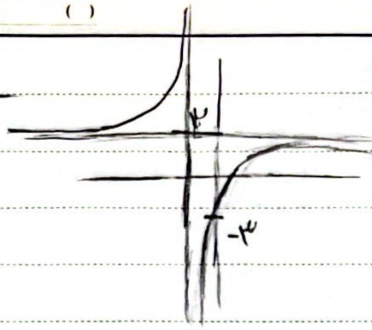
۶-

الف) $y=\frac{2x-3}{x+1}$

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

$x=0 \to y=-3$

$x+1=0 \to x=-1$

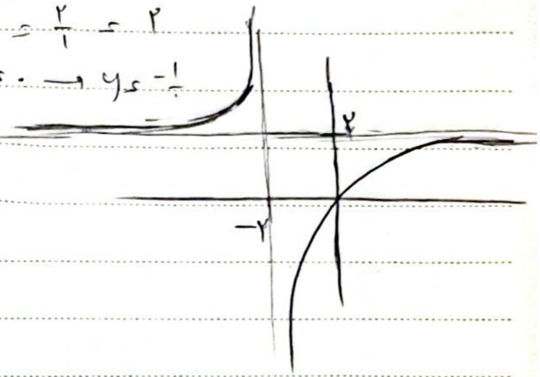


ب) $\frac{2x-1}{x+2}$

$x+2=0 \to x=-2$

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

$x=0 \to y=-\frac{1}{2}$



۷-

الف) $y=\sin x+\frac{1}{\sin x}$

$R_f=(-\infty \ -2] \cup [2 \ +\infty)$

ب) $y=\frac{x^4+1}{x^2} \to x^2+\frac{1}{x^2}$

$R_f=(-\infty \ -2] \cup [2 \ +\infty)$

ج) $y=\frac{\sqrt[3]{x^2}+1}{\sqrt[3]{x}} \to \sqrt[3]{x}+\frac{1}{\sqrt{x^2}}$

$R_f=(-\infty \ -2] \cup [2 \ +\infty)$

د) $\sqrt{x}+\frac{1}{\sqrt{x}}$

$R_f=[2 \ +\infty)$

۸-

الف) $y=x^2+\frac{1}{x^2+3} \quad +3-3$

$\underbrace{x^2+3+\frac{1}{x^2+3}-3}$

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

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

ب) $y=\frac{x^2+5}{\sqrt{x^2+4}}$

$\sqrt{x^2+4}+\frac{1}{\sqrt{x^2+4}} \to 2+\frac{1}{2}=\frac{5}{2}$

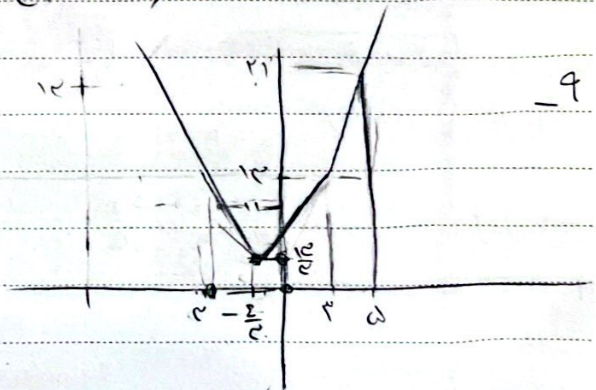
$R_f=[\frac{5}{2} \ +\infty)$

۹-

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

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

$-\frac{4}{3}$		3
$-x+3-3x-4$	$-x+3+3x+4$	$x-3+3x+4$
$-4x-1$	$2x+7$	$4x+1$
$-4(-2)-1=+11$	$(-\frac{4}{3})\times 2+7=\frac{13}{3}$	$3(4)+1=13$
		$5(4)+1=21$



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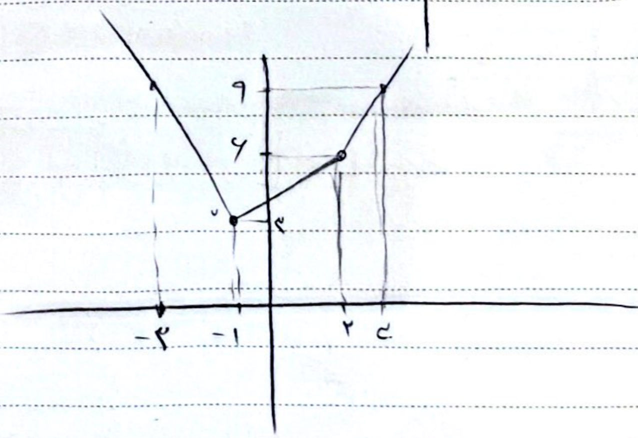
$y=|x-2|+|2x+2|$

-1		2
$-x+2-2x-2$	$-x+2+2x+2$	$x-2+2x+2$
$-3x$	$x+4$	$3x$
$-3\times -3=9$	$-1+4=3$	$3\times 2=6$



$R_f=[3 \ +\infty)$