نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۳ ..... کلاس دهم A .....

۱

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

$$x^2+(1-y)x+y+2=0 \longrightarrow x=\frac{y-1\pm\sqrt{(1-y)^2-4(y+2)}}{2}$$

$$(1-y)^2-4(y+2)\geq 0 \longrightarrow 1+y^2-2y-4y-8\geq 0 \Rightarrow y^2-6y-7\geq 0$$

$$(y-7)(y+1)$$

$$\frac{-1 \quad 7}{+\ 0\ -\ 0\ +}$$

(7) (-1)

$$R_f=(-\infty,-1]\cup[7,+\infty)$$

۲

الف) $y=2x^2-5x+1$ $\quad a>0$ دهانه سهمی رو به بالا و سهمی min دارد.

$$ext\begin{cases} x\to \frac{-b}{2a}=\frac{5}{4} \\ y\to 2\left(\frac{5}{4}\right)^2-\frac{2\times 5}{4}+1=\frac{-21}{8}\end{cases}$$

$$R_f=\left[\frac{-21}{8},+\infty\right)$$

ب) $y=\sqrt{-x^2+4x-5}$ $\quad a<0$ سهمی max دارد.

$$ext\begin{cases} x\to \frac{-b}{2a}=2 \\ y\Rightarrow 4\end{cases}$$

$-x^2+4x-5\to R_f=(-\infty,4]$

$\sqrt{(-\infty,4]}\to R_f=[0,2]$

c) $y=\sqrt{x^5-2x^3+4x+1}$

$x^5-2x^3+4x+1 \longrightarrow R=\mathbb{R}$

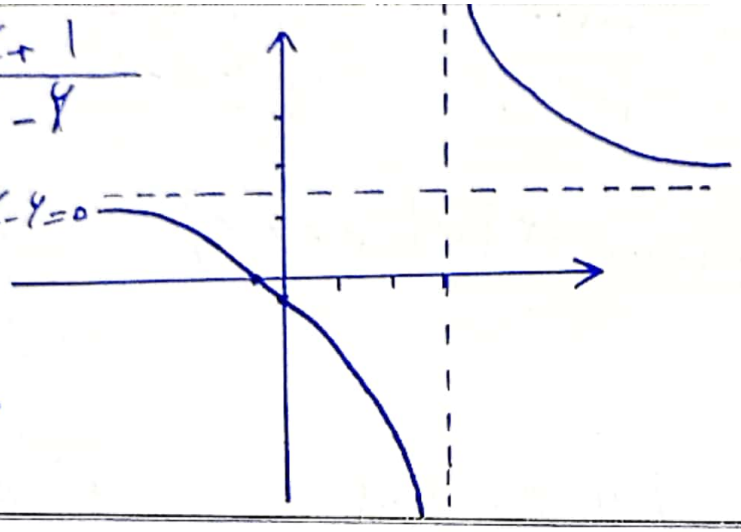
$\sqrt{\mathbb{R}} \longrightarrow \boxed{R_f=[0,+\infty)}$

د) $\text{Log}\left(x^3-4x^2+5x+6\right)$

$x^3-4x^2+5x+6 \longrightarrow R=\mathbb{R}$

$\text{Log}^{\mathbb{R}} \longrightarrow \mathbb{R} \longrightarrow \boxed{R_f=\mathbb{R}}$

الف) $y = \frac{3x+1}{2x-4}$

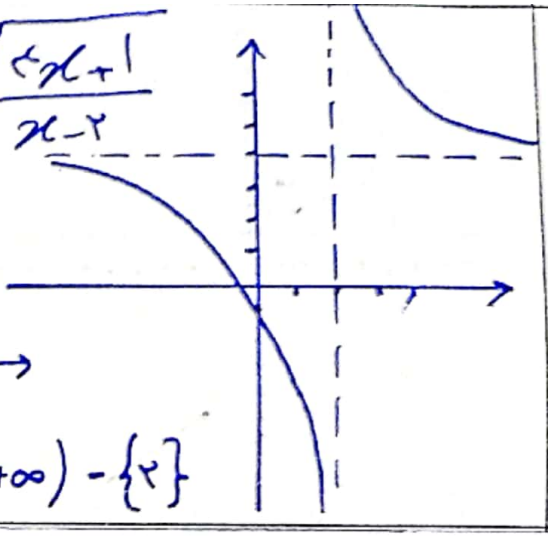


مجانب قائم $= 3 \rightarrow 2x-4=0$

مجانب افق $= \frac{3}{2}$

$R_f = \mathbb{R} - \{\frac{3}{2}\}$

ب) $y = \sqrt{\frac{4x+1}{x-2}}$



مجانب قائم $= 2$

مجانب افق $= 4$

$\sqrt{\mathbb{R} - \{4\}} \rightarrow$

$R_f = [0, +\infty) - \{2\}$

۳

ج) $y = \frac{x^2+4}{\sqrt{x^2+3}} \rightarrow \frac{x^2+3}{\sqrt{x^2+3}} + \frac{1}{\sqrt{x^2+3}} = \sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}}$

$a + \frac{1}{a} \rightarrow [2, +\infty)$

↙ درصورتی که a بتواند

① شود در غیر این صورت

بردار کمترین مقدار $a+\frac{1}{a}$ به بعد است

$R_f = \left[\sqrt{3} + \frac{1}{\sqrt{3}}, +\infty\right) = \boxed{\left[\frac{4}{\sqrt{3}}, +\infty\right)}$

د) $y = x^2 + \frac{1}{x^2+4} \rightarrow y+4 = x^2+4 + \frac{1}{x^2+4} \rightarrow R_{(y+4)} = [4+\frac{1}{4}, +\infty)$

$\boxed{R_f = [\frac{1}{4}, +\infty)}$

$$y=\frac{3x^2+4}{x^2-1}$$

II $\rightarrow x^2=0 \rightarrow y=-4$

$x^2=+\infty \rightarrow y=3$

$-4 \quad 3$

$\rightarrow R_f=(-\infty;-4]\cup(3,+\infty)$

۴

$$y=\frac{3x^2+4}{x^2-1} \rightarrow x^2=-\frac{-y-4}{y-3} \rightarrow x^2=\frac{y+4}{y-3} \rightarrow x=\pm\sqrt{\frac{y+4}{y-3}}$$

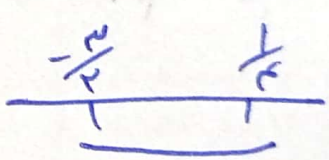
$$\frac{y+4}{y-3}\geq 0 \rightarrow \begin{array}{ccccc} & -4 & & 3 & \\ + & 0 & - & \Phi & + \end{array} \rightarrow \boxed{R=(-\infty,-4]\cup(3,+\infty)}$$

$$y=\frac{2\sin x-1}{\sin x+3} \xrightarrow{I} \sin x=-\frac{3y+1}{y-2} \rightarrow \sin x\ \frac{3y+1}{2-y}$$

$$-1\geq \frac{3y+1}{2-y} \geq 1 \rightarrow y\geq -\frac{3}{2},\ y\leq \frac{1}{4} \rightarrow R_f=\left[\frac{1}{4},-\frac{3}{2}\right]$$

$$\xrightarrow{II} \sin x=-1 \rightarrow \frac{-3}{2}$$

$$\sin x=1 \rightarrow \frac{1}{4} \rightarrow R_f=\left[-\frac{3}{2},\frac{1}{4}\right]$$



$f(x)=\frac{x^2-x+\frac{1}{4}}{x^2-x+1} \longrightarrow D_f=\mathbb{R}$ ۶

$\Delta<0$ (ریشه ندارد)

$x=\frac{1-y\pm\sqrt{(y-1)^2-4(1-y)(\frac{1}{4}-y)}}{2-2y}\to\neq 0$

$x^2-x+\frac{1}{4}=yx^2-yx+y \longrightarrow (1-y)x^2+(y-1)x+\frac{1}{4}-y=0$

$y^2-2y+1-4y^2+5y-1\geq 0 \to -3y^2+3y\geq 0 \to -y^2+y\geq 0 \quad y(-y+1)$ (0, 1)

$\boxed{R=[0,1)}$

الف) $|2x-2|-|x-3|$ ۷

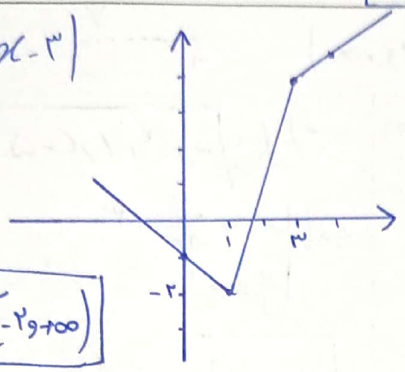
$x=1\to y=-2$

$x=2\to y=0$

$x=0\to y=-1$

$x=4\to$

$\boxed{R_f=[-2,+\infty)}$



ب) $y=|x-3|+|x+1|$

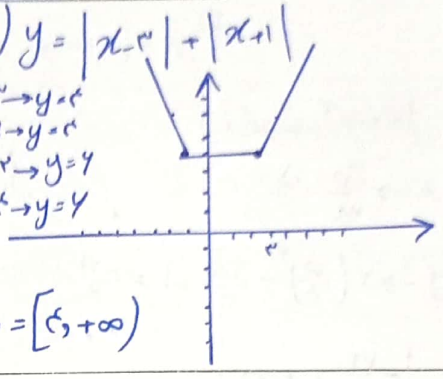
$x=3\to y=4$

$x=-1\to y=4$

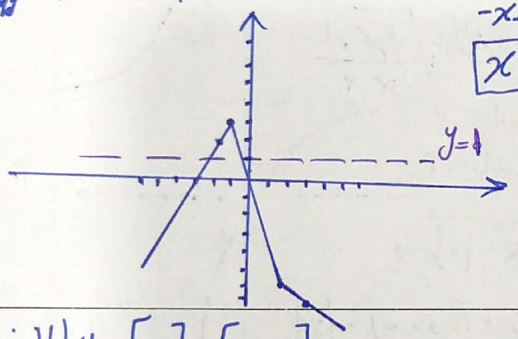
$x=-2\to y=5$

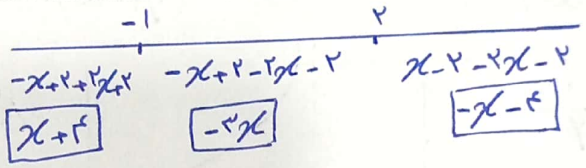
$x=4\to y=5$

$R_f=[4,+\infty)$



$|x-2|-|2x+2|\leq 1$ ۸





$-x+2+2x+2$ $\quad -x+2-2x-2$ $\quad x-2-2x-2$

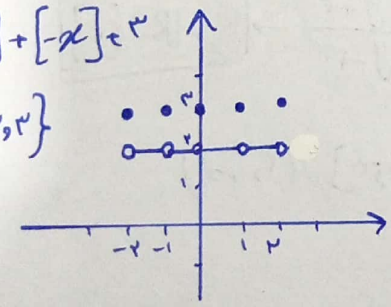
$\boxed{x+4}$ $\quad \boxed{-2x}$ $\quad \boxed{-x-4}$

$\to (-\infty,-4]\cup[-\frac{1}{2},+\infty)$

الف) $y=[x]+[3-x]$ ۹

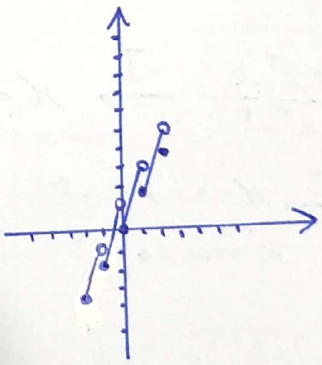
$\to [x]+[-x]+3$

$R_f=\{2,3\}$



ب) $y=3x-[x]$

$R_f=[-4,5)$



الف) $\sin^2x-\sin x+1$ ۱۰

$\uparrow \to 1-1+1=1$

$\downarrow \to 1+1+1=3$

$\frac{-b}{2a}\to \frac{-1}{2}\to \frac{1}{4}-\frac{2}{4}+1\to \frac{3}{4}$

$R_f=[\frac{3}{4},3]$

ب) $y=\sin^4x+\sin^2x+1$

$\uparrow \to 1+1+1=3$

$\downarrow \to 0+0+1=1$

$\frac{-b}{2a}\to \frac{-1}{2}$ بیرون

$R_f=[1,3]$