نام و نام خانوادگی ......[handwritten name]...... پاسخنامه تشریحی تکلیف شماره ...۳... کلاس ......

۱۹

۱ (۲)

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

$\Rightarrow \Delta = y^2-2y+1-4y-8>0 \Rightarrow y^2-6y-7>0 \Rightarrow (y-7)(y+1)>0 \rightarrow y>7, y<-1$

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

۲ (۲)

الف) $2x^2-5x+1 \Rightarrow \frac{-b}{2a} \Rightarrow \frac{5}{4} \Rightarrow 2\times\frac{25}{16}-\frac{25}{4}+1 \Rightarrow \frac{25}{8}-\frac{50}{8}+\frac{8}{8} = -\frac{17}{8} \Rightarrow y \geq -\frac{17}{8}$

ب) $y=\sqrt{-x^2+6x-5} \Rightarrow \frac{-b}{2a}=3 \Rightarrow -9+18-5=4 \Rightarrow R_f=[0,2]$

ج) $y=\sqrt{x^4-3x^2+12x+1} \Rightarrow R^+\cup\{0\} = [0,+\infty)$

د) $\log(x^3-6x^2+7x+4) \Rightarrow x^3-6x^2+7x+4>0 \Rightarrow R_f=\mathbb{R}$

۳ (۲)

الف) $y=\frac{3x+1}{2x-6} \Rightarrow x=\frac{6y+1}{2y-3} \Rightarrow R_f \Rightarrow \mathbb{R}-\{\frac{3}{2}\}$

ب) $y=\sqrt{\frac{4x+1}{x-2}} \Rightarrow y^2=\frac{4x+1}{x-2} \Rightarrow x=\frac{2y^2+1}{y^2-4} \Rightarrow R_f \Rightarrow [0,+\infty)-\{2\}$

ج) $y=\frac{x^2+4}{\sqrt{x^2+3}} \Rightarrow y=\sqrt{x^2+3}+\frac{1}{\sqrt{x^2+3}} \Rightarrow R_f=[\frac{4\sqrt{3}}{3},+\infty)$

د) $y=x^2+\frac{1}{x^2+4}$

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

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

۴ (۲)

$y=\frac{3x^2+4}{x^2-1} \Rightarrow x^2=\frac{y+4}{y-3} \Rightarrow x=\sqrt{\frac{y+4}{y-3}} \Rightarrow R_f=(-\infty,-4]\cup(3,+\infty)$

$\downarrow$

$yx^2-y=3x^2+4 \Rightarrow 3x^2-yx^2=-(y+4) \Rightarrow x^2(3-y)=-(y+4)$

$\Rightarrow x^2=\frac{y+4}{y-3} \Rightarrow x=\sqrt{\frac{y+4}{y-3}} \Rightarrow R_f=(-\infty,-4]\cup(3,+\infty)$ دقت!

۵ (۱/۵)

$y=\frac{2\sin x-1}{\sin x+3} \Rightarrow \sin x=\frac{3y+1}{y-2} \Rightarrow R_f=[-\frac{3}{2},\frac{1}{4}]$

$\rightarrow y\sin x+3y=2\sin x-1 \Rightarrow (y-2)\sin x=-3y-1 \Rightarrow \sin x=\frac{3y+1}{y-2}$

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

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

۶ (۲)

$f(x)=\frac{x^2-x+\frac{1}{4}}{2x^2-x+1} \Rightarrow x^2-x+1\neq 0 \Rightarrow \Delta<0 \Rightarrow D_f=\mathbb{R}$ ✓

$\rightarrow R_f=[0,1)$ ✓

$\rightarrow f(x)=\frac{x^2-x+1-\frac{3}{4}}{x^2-x+1}=1-\frac{3}{4x^2-4x+4} \rightarrow 0<\frac{3}{4x^2-4x+4}\leq 1$

در امتحان تشریحی باید توضیح بدهی ←

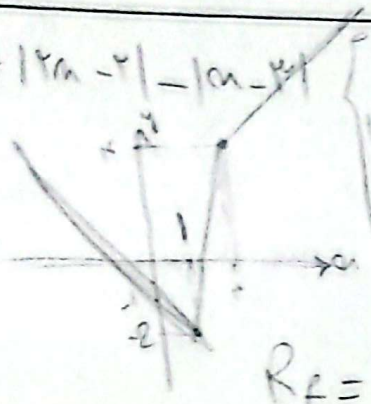
۷ (۲)

$y=|2x-2|-|x-3|$

$x\geq 3 \Rightarrow x$

$1\leq x<3 \rightarrow 2x$

$x<1 \rightarrow -x$

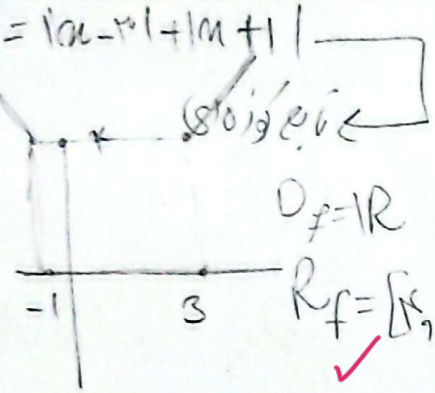


$R_f=[-2,+\infty)$ ✓

$y=|x-3|+|x+1|$

نمودار قدر مطلق

$D_f=\mathbb{R}$



$R_f=[4,+\infty)$ ✓

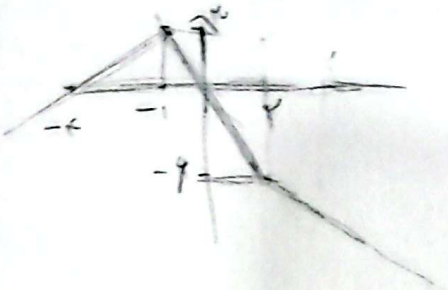
۸ (۲)

$|x-2|-|2x+2|\leq 1$

$x<-1 \Rightarrow x+3$

$-1\leq x\leq 2 \Rightarrow -x+2-2x-2 \Rightarrow -3x-4$

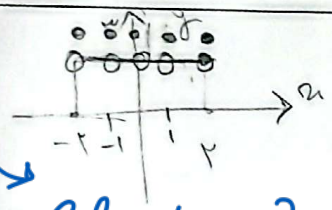
$x>2 \Rightarrow -x-3$



$R_f=(-\infty,-2]\cup[-\frac{1}{3},+\infty)$ ✓

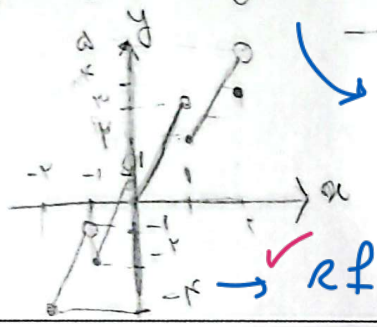
۹ (۱٫۵)

$y=[x]+[3-x] \Rightarrow y=[x]+3+[-x] \Rightarrow y=3$



$R_f=\{2,3\}$?

$y=3x-[x]$ ⇝



$R_f=[-2,5)$ ✓

۱۰ (۲)

$y=\sin^2 x-\sin x+1 \Rightarrow$

$\sin x=1 \Rightarrow 1-1+1=1$

$-\frac{b}{2a} \Rightarrow \frac{1}{2} \Rightarrow \frac{1}{4}-\frac{1}{2}+1=\frac{3}{4} \Rightarrow [\frac{3}{4},3]$ ✓

$\sin x=-1 \Rightarrow 1+1+1=3$

$y=\sin^4 x+\sin^2 x+1$

$\sin^2=1 \Rightarrow 1+1+1=3$

$-\frac{b}{2a}=-\frac{1}{2} \Rightarrow \frac{1}{4}+\frac{1}{2}+1=\frac{7}{4} \rightarrow [1,3]$ ✓

$\sin^2=0 \Rightarrow 0+0+1=1$