پاسخنامه تشریحی تکلیف شماره ۱۱.۸.۱ ... کلاس یازدهم دختر B ... نیایش امانی ...

۱

$2g = \{(-1,2),(0,8),(2,0),(1,4))$ $\quad 3f(x) = 3\sqrt{1-x^2} = \{(-1,0),(0,3),(1,0)\}$

$2g-3f = \{(-1,2),(0,5),(1,4)\}$ $\quad R_f = \{5,2,4\}$ $\quad 4+2+5=11$

۲

$f(x)=2x-1 \quad D_f=[3,+\infty) \quad R_f=[5,+\infty)$

$g(x)=\frac{1}{3}x+3 \quad D_f=(-\infty,3] \quad R_f=(-\infty,4]$

$R_f\, g(x) \cup R_f\, f(x) = (-\infty,4] \cup [5,+\infty)$

۳

$y=-\frac{x^2}{2}+x+3 \qquad (a,b) \qquad a>\frac{3}{2}$ $\quad$ بیشترین مقدار $\sqrt{b-a}$

$-\frac{x^2}{2}+x+3=\frac{3}{2} \Rightarrow -x^2+2x+6=3 \Rightarrow -x^2+2x+3=0$

$\Delta=4+12=16 \qquad x=\frac{-2\pm\sqrt{16}^{\,4}}{-2}=\begin{cases}-1\\3\end{cases} \Rightarrow -1<x<3 \Rightarrow (\underset{a}{-1},\underset{b}{3})$

$\sqrt{b-a}=\sqrt{\underset{4}{\underbrace{3-(-1)}}}=2$

۴

$y=|\underset{+1}{x-1}|+|\underset{3}{x-3}|+|\underset{2}{2x-4}| \Rightarrow |x-1|+|x-3|+2|x-2|$

$\begin{cases} x-1-x+3+2x-4=2x-2 & 2\leq x\leq 3 \\ x-1+4-2x+3-x=-2x+6 & 1\leq x\leq 2 \end{cases}$ $\qquad$ کمترین مقدار $y=2 \Leftarrow x=2$

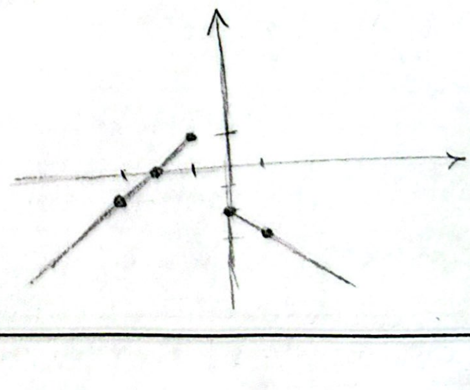
۲

۵

$y=|\underset{0}{x}|-2|\underset{-1}{x+1}|$ $\quad -x-1$

$\begin{cases} x-2x-2=-x-2 & x\geq 0 \\ -x+2x+2=x+2 & x\leq -1 \\ -x-2x-2=-3x-2 & -1\leq x\leq 0 \end{cases}$

$R_f=(-\infty,1]$



$y=\dfrac{x^2+5x+m}{x+1}$ $\quad x\neq -1$ $\quad$ if $R_f=\mathbb{R}$ $\quad$ چند مقدار عدد طبیعی برای m ؟

$\{1,2,3\} \leftarrow (3)$

$x^2+5x+m=yx+y \Rightarrow x^2+5x+m-yx-y=0 \Rightarrow x^2+x(5-y)+(m-y)=0$ 6

$\Delta=b^2-4ac=(5-y)^2-4(m-y)=y^2-10y+25-4m+4y=y^2-6y+(-4m+25)$ $\quad \Delta y \geq 0$

$b^2-4ac=36-4(-4m+25)=36+16m-100=16m-64 \Rightarrow 16m-64\leq 0 \Rightarrow m\leq 4$ $\quad m\neq 4 \Rightarrow y\neq 3$

$\Rightarrow m<4 \Rightarrow \{1,2,3\}$ | m می تواند دارای ۳ عدد باشد

$f(x)=\begin{cases} x+2 & x\geq 3 \quad 5,6,\dots \\ x^2-2x+2 & 0\leq x<3 \quad 2,1,2,\cancel{5} \\ |x|+2 & x<0 \quad 3,4,5,\dots \end{cases}$ $\quad R_f=?$ $\quad R_f=[1,+\infty)$ 7

$f(x)=\begin{cases} x^2+4x+3 & x\leq 0 \quad 3,0,-1 \\ [2x]-2x & x>0 \quad (-1,0] \end{cases}$ $\quad R_f=?$ $\quad [-1,+\infty)$

$x^2+4x+3=(x+2)^2-1 \Rightarrow [-1,+\infty)$ 8

$y=a+1-\sqrt{2x+3}$ $\quad D_f=[b,+\infty)$ $\quad R_f=(-\infty,5]$ $\quad ab=?$

$2x+3\geq 3 \Rightarrow x\geq 1.5$ $\quad b=1.5$ $\quad a=4$ $\quad \Rightarrow ab=4\times 1.5=\boxed{6}$ 9

$f(x)=2\sqrt{x+1}+4\sqrt{1-x}$, $f(x)+g(x)=3\sqrt{2+2\sqrt{1-x^2}}$, $D_f=D_g=[-1,1]$

$R_f \Rightarrow y=\dfrac{f(x)}{6}-\dfrac{g(x)}{3}$

$f(x)+g(x)=3\sqrt{2+2\sqrt{1-x^2}}=3\sqrt{2(1+\sqrt{1-x^2})}=3\sqrt{2}\sqrt{1+\sqrt{1-x^2}}$ 10

$g(x)=f(x)+g(x)-f(x)=3\sqrt{2}\sqrt{1+\sqrt{1-x^2}}-(2\sqrt{x+1}+4\sqrt{1-x})$ $\quad x\in[-1,1]$

$\dfrac{f(x)}{6}=\dfrac{2\sqrt{x+1}+4\sqrt{1-x}}{6}=\dfrac{\sqrt{x+1}}{3}+\dfrac{2\sqrt{1-x}}{3}$ $\quad R_f=[0,\sqrt{2}]$

به ازای +1 $\quad$ به ازای -1

$\dfrac{g(x)}{3}=\dfrac{\cancel{3}\sqrt{2}\sqrt{1+\sqrt{1-x^2}}-2\sqrt{x+1}+4\sqrt{1-x}}{3}=\sqrt{2}\sqrt{1+\sqrt{1-x^2}}-\dfrac{2}{3}\sqrt{x+1}-\dfrac{4}{3}\sqrt{1-x}$

$\dfrac{f(x)}{6}-\dfrac{g(x)}{3}=\dfrac{\sqrt{x+1}}{3}+\dfrac{2\sqrt{1-x}}{3}-\sqrt{2}\sqrt{1+\sqrt{1-x^2}}+\dfrac{2}{3}\sqrt{x+1}+\dfrac{4}{3}\sqrt{1-x}=\sqrt{x+1}+2\sqrt{1-x}-\sqrt{2}\sqrt{1+\sqrt{1-x^2}}$

$-1 \quad 1 \quad 2\sqrt{2}-2\sqrt{2}-\sqrt{2}$