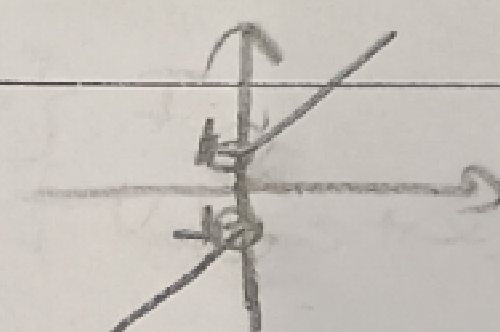
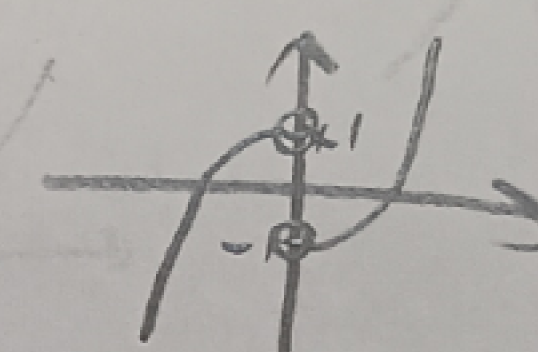
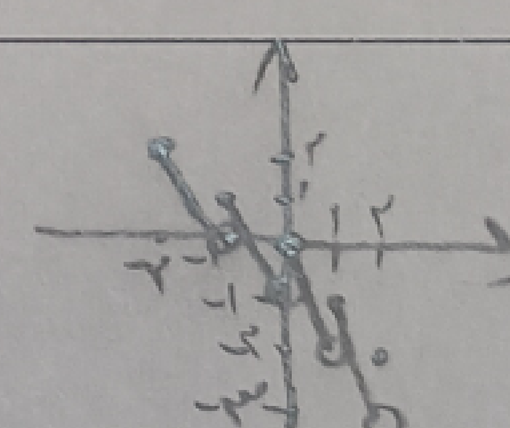
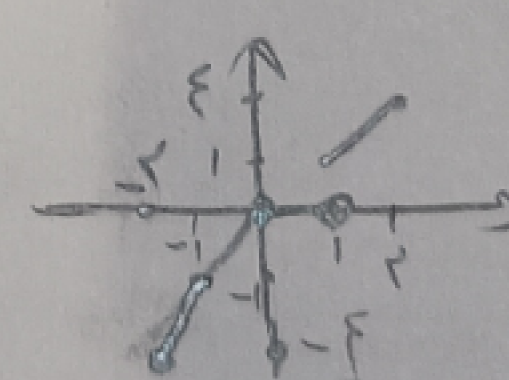
نام و نام خانوادگی ...محمد شیرانی... پاسخنامه تشریحی تکلیف شماره ...7... کلاس ...11/B...

الف) $y = x + \|2x-4\|$ $\begin{cases} x+2x-4 = 3x-4 & x>2 \\ 2 & x=2 \\ x-2x+4 = -x+4 & x<2 \end{cases}$ $R_f = [2, +\infty)$ ب) $y = \|x-2\| + \|x-1\| - \|x\|$ $\begin{cases} x-2+x-1-x = x-3 & x \geq 2 \\ -x+2+x-1-x = -x+1 & 1 \leq x < 2 \\ -x+2-x+1-x = -3x+3 & 0 \leq x < 1 \\ -x+2-x+1+x = -x+3 & x<0 \end{cases}$ $R_f = [-1, +\infty)$	۱
$\|2x-3\| - \|x+2\| = k$ $\begin{cases} 2x-3-x-2=k & x \geq 1 \rightarrow 2x-5=k \\ -2x+3-x-2=k & -2 \leq x < 1 \rightarrow -3x+1=k \\ -2x+3+x+2=k & x<-2 \rightarrow -2x+5=k \end{cases}$ $\Longrightarrow \begin{matrix} x=2 \rightarrow k=9 \\ x=1 \rightarrow k=-3 \end{matrix}$	۲
الف) $y = x + \frac{x}{\|x\|}$ $\begin{cases} x>0 & x+1 \\ x<0 & x-1 \end{cases}$  ب) $y = x\|x\| - \frac{x}{\|x\|}$ $\begin{cases} x>0 \rightarrow x^2-1 \\ x<0 \rightarrow -x^2+1 \end{cases}$ 	۳
الف) $y = [x] - 2x$  ب) $y = [x]\|x\|$ 	۴
الف) $y = 2x - [2x] \longrightarrow \begin{cases} x \notin \frac{Z}{2} \rightarrow y = (0,1) \\ x \in \frac{Z}{2} \rightarrow y=0 \end{cases}$ $R_f = [0,1)$ ب) $y = 4x - 4[x] \rightarrow 4(x-[x]) \rightarrow R_f = [0,4)$ ج) $y = x - 5\left[\frac{x}{5}\right] \rightarrow R_f = [0,4]$ د) $y = [2x] - 2x \rightarrow R_f = (-1,0]$	۵

الف) $y = 3\sin x + 4\cos x \rightarrow R_f = [-5, 5]$ ب) $y = 4\sin x - 3\cos x \rightarrow R_f = [-5, 5]$ ج) $y = [2\sin x + 5\cos x] \rightarrow [-\sqrt{29}, \sqrt{29}] \xrightarrow{\text{براکت}} R_f = \{-6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$ د) $y = \sqrt{\cos x - 2\sin x} \rightarrow [-\sqrt{5}, \sqrt{5}] \xrightarrow{\text{زیر رادیکال}} R_f = [0, \sqrt{5}]$	۶
الف) $y = \sin^2 x + 3\sin x + 2 \rightarrow \sin x = \frac{-b}{2a} = \frac{-3}{2} \rightarrow f(\frac{-3}{2}) = -\frac{1}{4}$ min $R_f = [-\frac{1}{4}, 6]$ $\sin x = 1 \rightarrow 6$ max $\quad \sin x = -1 \rightarrow 0$ ب) $y = 2\sin^2 x + 3\sin x + 2 \rightarrow \sin x = \frac{-b}{2a} = \frac{-3}{4} \rightarrow f(\frac{-3}{4}) = \frac{7}{8}$ min $R_f = [\frac{7}{8}, \square]$ max $\sin x = 1 \rightarrow 7 \quad \sin x = -1 \rightarrow 1$	۷
الف) $y = \sin^2 x + 4\cos^2 x \Rightarrow 1 - \cos^2 x + 4\cos^2 x = 1 + \underbrace{3\cos^2 x}_{[0, 3]} \rightarrow R_f = [1, 4]$ ب) $y = \frac{2\cot x}{1+\cot^2 x} \Rightarrow \frac{2\cos x}{\sin x} \times \sin^2 x = 2\cos x \sin x \rightarrow y = \sin 2x \rightarrow R_f = [-1, 1]$	۸
الف) $y = \sin^6 x + \cos^6 x \xrightarrow{\text{طبق رابطه}} \frac{1}{4} \leq \sin^6 x + \cos^6 x \leq 1$ ب) $y = [\sin^8 x + \cos^8 x] \xrightarrow{\text{طبق رابطه}} \frac{1}{8} \leq \sin^8 x + \cos^8 x \leq 1 \xrightarrow{\text{براکت}} R_f = \{0, 1\}$	۹
الف) $y = \frac{2x^2 + 7x - 4}{x + 4} = \frac{(x+4)(2x-1)}{(x+4)} \Rightarrow y = 2x - 1 \xrightarrow{x=-4} -8 - 1 = -9 \rightarrow R_f = \mathbb{R} - \{-9\}$ ب) $y = \frac{x^3 - 1}{x - 1} = \frac{(x-1)(x^2+1+x)}{(x-1)} \Rightarrow y = x^2 + x + 1 \rightarrow \frac{-b}{2a} = \frac{-1}{2} \rightarrow x = \frac{-1}{2} \rightarrow y = \frac{3}{4} \rightarrow$ min $\quad R_f = [\frac{3}{4}, +\infty)$	۱۰