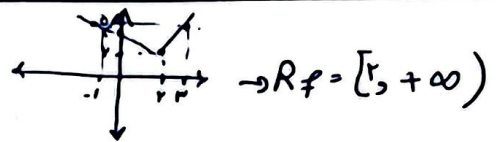
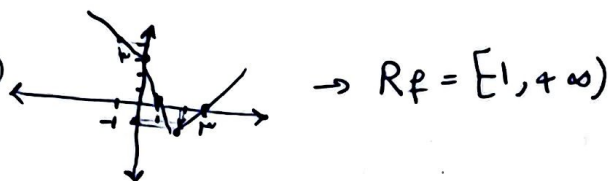


نام و نام خانوادگی: زهرا سادات حسینی با شماره دانشجویی ۱۹۷۵۰ ... کلاس: ریاضی و حساب دیفرانسیل

الف) $y = x + |2x - 4| \rightarrow \begin{cases} -x + 4 & ; x < 2 \\ 3x - 4 & ; x \geq 2 \end{cases}$



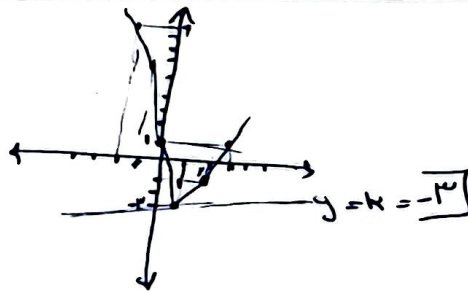
ب) $y = |x - 2| + |x - 1| + |x|$



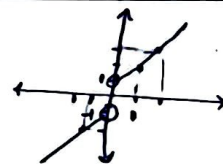
$|2x - 3| - |x + 2| = k$

① $\rightarrow$ ②

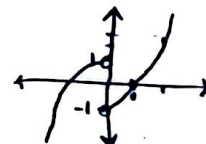
$$\begin{array}{c|c|c} -2x + 5 & -x - 1 & 2x - 3 - x - 2 \\ \hline -2x + 5 & -x - 1 & x - 5 \end{array}$$



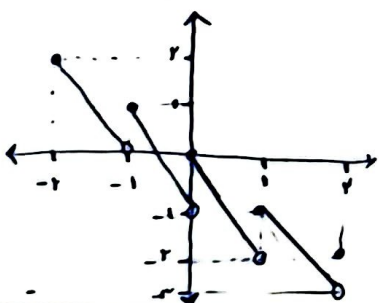
الف) $y = x + \frac{x}{|x|} \rightarrow D_f = \mathbb{R} - \{0\} \rightarrow \begin{cases} x + 1 & ; x < 0 \\ x - 1 & ; x > 0 \end{cases}$



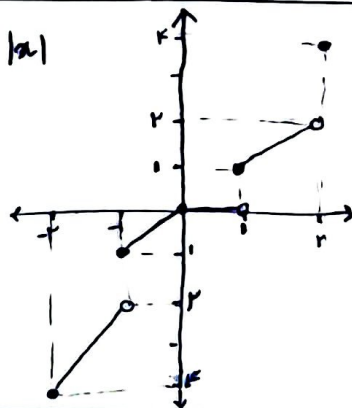
ب) $y = x|x| - \frac{x}{|x|} \rightarrow D_f = \mathbb{R} - \{0\} \rightarrow \begin{cases} -x^2 + 1 & ; x < 0 \\ x^2 - 1 & ; x > 0 \end{cases}$



الف) $y = [x] - 2x$



ب) $y = [x]|x|$



الف) $y = 2x - [2x] \rightarrow 0 \leq 2x - [2x] < 1 \rightarrow R_f = [0, 1)$

ب) $y = x([x] - [x]) \rightarrow R_f = [0, 1)$

ج) $\frac{y}{\omega} = \frac{x}{\omega} - [\frac{x}{\omega}] \rightarrow 0 \leq \frac{x}{\omega} - [\frac{x}{\omega}] < 1 \xrightarrow{\times \omega} [0, \omega) = R_f$

د) $[2x] - 2x \rightarrow R_f = (-1, 0]$

الف) $-\sqrt{r^2+r^2} \leq r \sin u + r \cos u \leq \sqrt{r^2+r^2} \rightarrow R_f = [-\sqrt{1^2}, \sqrt{1^2}]$

ب) $-\sqrt{\varepsilon^2+(-r)^2} \leq \varepsilon \sin u - r \cos u \leq \sqrt{\varepsilon^2+(-r)^2} \rightarrow R_f = [-\delta, \delta]$

ج) $-\sqrt{r^2+\delta^2} \leq r \sin u + \delta \cos u \leq \sqrt{r^2+\delta^2} \xrightarrow{\text{دالة}} R_f = \left\{ \frac{\pi}{2}, -\frac{\pi}{2}, -\frac{\pi}{4}, -\frac{3\pi}{4}, 0, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{2} \right\}$

د) $-\sqrt{1+(-r)^2} \leq \cos u - r \sin u \leq \sqrt{1+(-r)^2} \rightarrow \sqrt{[-\delta, +\delta]} \rightarrow [0, \sqrt{\delta}] = R_f$

الف) $\sin u + r \sin u + r$
 $\begin{matrix} \nearrow r+r+r=0 \\ \searrow r-r+r=0 \end{matrix} \rightarrow R_f = [0, r]$
 $x \frac{r}{r} = \frac{b}{ra}$

ب) $r \sin u + r \sin u + r$
 $\begin{matrix} \nearrow r+r+r=r \\ \searrow r-r+r=1 \end{matrix} \rightarrow R_f = \left[\frac{r}{1}, r \right]$
 $\frac{r}{r} = \frac{b}{ra} \rightarrow \frac{r}{1} - r + r = \frac{r}{1}$

الف) $\underbrace{\sin^2 u + \cos^2 u}_1 + \underbrace{r \cos^2 u}_{[0, r]} \rightarrow R_f = [1, \varepsilon]$

ب) $\frac{r \cos u}{\sin u} = r \cos u \sin u \rightarrow \sin^2 u \rightarrow R_f = [-1, 1]$

الف) $r^{1-\frac{1}{\varepsilon}} \leq \sin^{\frac{1}{\varepsilon}} u + \cos^{\frac{1}{\varepsilon}} u \leq 1 \rightarrow r^{-\frac{1}{\varepsilon}} \leq \sin^{\frac{1}{\varepsilon}} u + \cos^{\frac{1}{\varepsilon}} u \leq 1 \rightarrow R_f = \left[\frac{1}{\varepsilon}, 1 \right]$

ب) $r^{1-\frac{1}{\varepsilon}} \leq \sin^{\frac{1}{\varepsilon}} u + \cos^{\frac{1}{\varepsilon}} u \leq 1 \rightarrow \frac{1}{\varepsilon} \leq \sin^{\frac{1}{\varepsilon}} u + \cos^{\frac{1}{\varepsilon}} u \leq 1 \rightarrow \left[\frac{1}{\varepsilon}, 1 \right] \xrightarrow{\text{دالة}} R_f = [0, 1]$

الف) $\frac{r^{n+1} + r^{n-1}}{r^n + r} = \frac{r^2 + r^{n-1}}{r + r} = \frac{(r+1)(r^{n-1})}{r+1} = r^{n-1} \xrightarrow{n=-2} y = -9 \rightarrow R_f = \mathbb{R} - \{-9\}$

ب) $\frac{r^n - 1}{r - 1} = \frac{(r-1)(r^{n-1} + r^{n-2} + \dots + 1)}{(r-1)} = r^{n-1} + r^{n-2} + \dots + 1 \rightarrow \frac{b}{ra} = \frac{-1}{r} \rightarrow \frac{1}{\varepsilon} - \frac{1}{r} + 1 = \frac{r}{\varepsilon}$

$D_f = \mathbb{R} - \{1\}$ $R_f = \left[\frac{r}{\varepsilon}, +\infty \right)$