Date: Sub: به نام خدا تکلیف معین

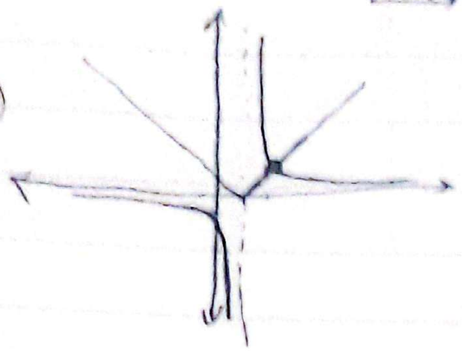
① ۱-

$x=2 \Rightarrow x-1=t \Rightarrow t=1 \Rightarrow 1=t^2 \;\; t\geq 0 \;\; \frac{1}{t}=|t| \longleftarrow x-1=t$

$t<0 ,\; 1=-t^2$ غ ق ق

یک ریشه

②



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۲-

الف) $\left|\frac{2x-1}{x}\right| < 2 \qquad -2 < \frac{2x-1}{x} < 2 \Rightarrow x \in \left(\frac{1}{4}, +\infty\right)$

$0 < \frac{2x-1+2x}{x} \qquad \frac{2x-1-2x}{x} < 0 \rightarrow x>0$

$(-\infty, 0) \cup \left(\frac{1}{4}, +\infty\right)$

ب) $\left|\frac{x-2}{2x+1}\right| > 1 \qquad \frac{x-2}{2x+1} > 1 \qquad \frac{x-2-2x-1}{2x+1} > 0 \;\; (-x-3) \qquad -3 \;\; -\frac{1}{2}$

$\frac{x-2}{2x+1} < -1 \qquad \frac{x-2+2x+1}{2x+1} < 0 \;\; (3x-1) \qquad -\frac{1}{2} \;\; \frac{1}{3}$

مجموعه جواب $\Leftarrow \left(-3, -\frac{1}{2}\right) \cup \left(-\frac{1}{2}, \frac{1}{3}\right)$

۳-

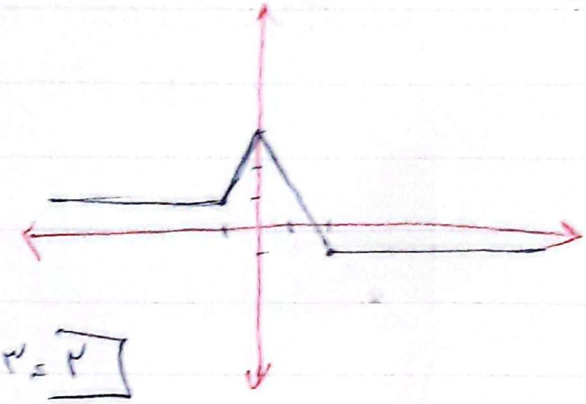
$x^2 < |x+6| \xrightarrow{x^2>0} x^2 - x < 6 \rightarrow \left(x-\frac{1}{2}\right)^2 < 6+\frac{1}{4}$

$\left|x-\frac{1}{2}\right| < \frac{5}{2} \longrightarrow \boxed{\alpha = \frac{1}{2}}$

Elipon

$y = |x+1| - |x| + |x-2|$ — ۴

$x<-1$	$-1<x<0$	$0<x<2$	$x>2$
$-x-1+x+2-x$	$x+1+x+2-x$	$x+1-x+2-x$	$x+1-x+x-2$
$+1$	$2x+3$	$-2x+3$	-1



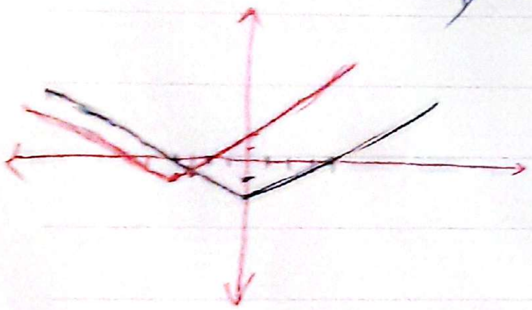
$Max = 3 \quad Min = -1 \Rightarrow -1+3 = \boxed{2}$

$\left|\frac{1}{2}(x+4)\right| - 2 + 1 \Longrightarrow \left|\frac{1}{2}x+2\right| - 1$ — ۵

$\left|\frac{1}{2}x+2\right| - 1 = \left|\frac{1}{2}x\right| - 2$

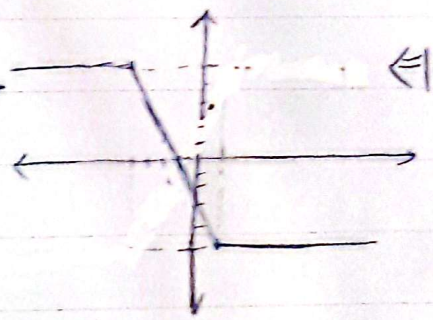
$x<-4$	$-4<x<0$	$x>0$
$-\cancel{\frac{1}{2}x}-2-1=-\cancel{\frac{1}{2}x}$	$\frac{1}{2}x+3=-\frac{1}{2}x \to x=-3$	$\cancel{\frac{1}{2}x}=\cancel{\frac{1}{2}x}+2$

$\boxed{x = -3}$



الف) $f(x) = \left[\,|1-x| - |x+4|\,\right] \Rightarrow \left[\underbrace{|x-1| - |x+4|}_{R=[-5,5]}\right] \Longrightarrow \boxed{R_f = \{\pm 5, \pm 4, \pm 3, \pm 2, \pm 1, 0\}}$ — ۶

$\Longrightarrow$



$\Leftarrow |x-1| - |x+4|$

ب) $f(x) = \frac{1}{x} - \left[\frac{x+1}{x}\right] = \frac{1}{x} - \left[\frac{1}{x}+1\right] = \underbrace{\frac{1}{x} - \left[\frac{1}{x}\right]}_{[0,1)} - 1 \Longrightarrow \boxed{R_f = [-1, 0)}$

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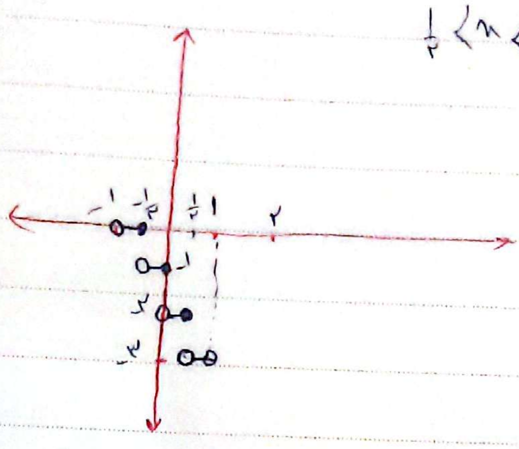
الف) $y=[-2x]-1$

$-1<x<-\frac{1}{2} \longrightarrow [-2x]=1 \xrightarrow{-1} 0$

$-\frac{1}{2}<x<0 \longrightarrow [-2x]=0 \xrightarrow{-1} -1$

$0<x<\frac{1}{2} \longrightarrow [-2x]=-1 \xrightarrow{-1} -2$

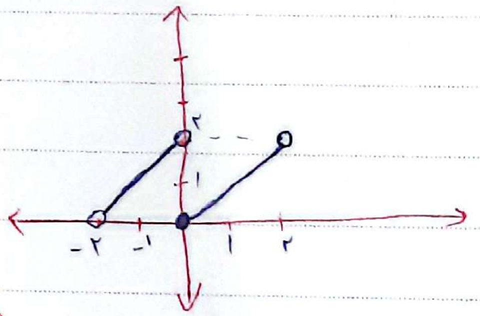
$\frac{1}{2}<x<1 \longrightarrow [-2x]=-2 \xrightarrow{-1} -3$



ب) $y=x-2\left[\frac{x}{2}\right]=2\left(\frac{x}{2}-\left[\frac{x}{2}\right]\right)$

$-2<x<0 \longrightarrow \left[\frac{x}{2}\right]=-1 \longrightarrow y=x+2$

$0<x<2 \longrightarrow \left[\frac{x}{2}\right]=0 \longrightarrow y=x$



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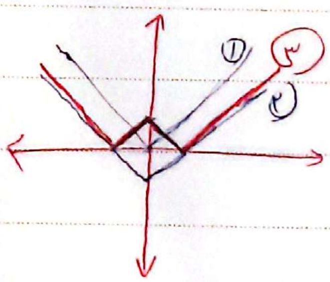
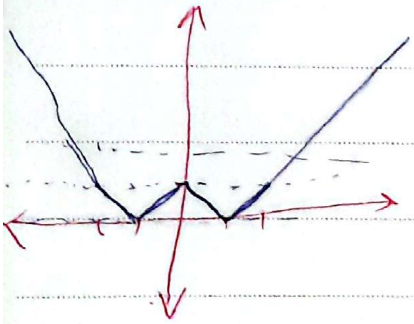
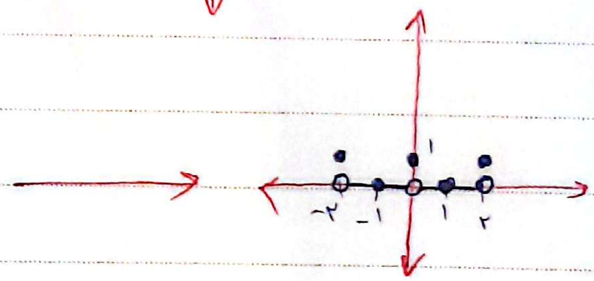
الف) $y=\big[|x|-1\big]$







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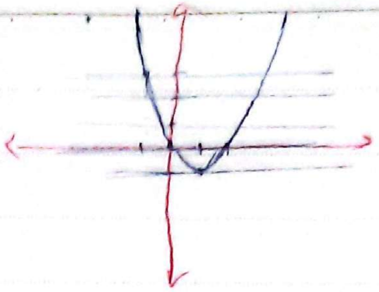
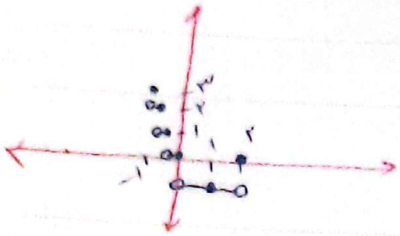
—) $y = [x^2 - 2x] = [x(x-2)]$





۹ —

$b - [a] = 3/4 \longrightarrow b = 3/4$

$a + [b] = 4/2 \longrightarrow a = 1/2$

$\underbrace{[b] - [a]}_{2} + \underbrace{[a] + [b]}_{4} \Rightarrow [b] = 3 \longrightarrow [a] = 1$

۱۰ —

$(1+\sqrt{2})^6 = 198 - (1-\sqrt{2})^6 \Rightarrow 197 < (1+\sqrt{2})^6 < 198 \longrightarrow [(1+\sqrt{2})^6] = \boxed{197}$

$1 - \sqrt{2} \simeq -0/7 \longrightarrow 0 < (-0/7)^6 < 1$

on