Date ۱۷٫۷۵ No

[illegible] شماره: ۲۰

(1) $\frac{1}{x-1} = |x-1| \xrightarrow[(1)]{x>1} \frac{1}{x-1} = x-1 \to x^2-2x+1=1 \to$

$x^2-2x=0 \to x=0 ✗,\ x=2 ✓$, $\xrightarrow[(2)]{x<1} \frac{1}{x-1} = 1-x \to$

$-x^2+2x-1=1 \to x^2-2x+2=0 \to \Delta = b^2-4ac<0 \Rightarrow$ غیرقابل‌قبول : $x=2$

(2) الف) $\left|\frac{2x-1}{x}\right| < 2 \to -2 < \frac{2x-1}{x} < 2 \xrightarrow{(1)} \frac{2x-1-2x}{x} < 0 \to$

$-x<0 \to x>0$, (2) $\frac{2x-1+2x}{x} > 0 \to$ $\begin{array}{c} 0 \quad \frac{1}{4} \\ + \quad - \quad + \end{array}$ $\xrightarrow{(1)\cap(2)} x\in(\frac{1}{4},+\infty)$ ۱٫۷۵

ب) $\left|\frac{x-2}{2x+1}\right|>1 \xrightarrow{(1)} \frac{x-2}{2x+1}>1 \to \frac{x-2-2x-1}{2x+1}>0 \to$ $\begin{array}{c} -3 \quad -\frac{1}{2} \\ - \quad + \quad - \end{array}$ ($-x-3$)

$\to (2)\ \frac{x-2}{2x+1}<-1 \to \frac{x-2+2x+1}{2x+1}<0 \to$ $\begin{array}{c} -\frac{1}{2} \quad \frac{1}{3} \\ - \quad + \quad - \end{array}$ $\to$ ($3x-1$)

$(1)\cap(2) \to x\in(-3,-\frac{1}{2})\ (-\frac{1}{2},\frac{1}{3})$

(3) $x^2 < |x+6| \to x^2<x+6 \xrightarrow{(1)} x^2-x-6<0 \to$

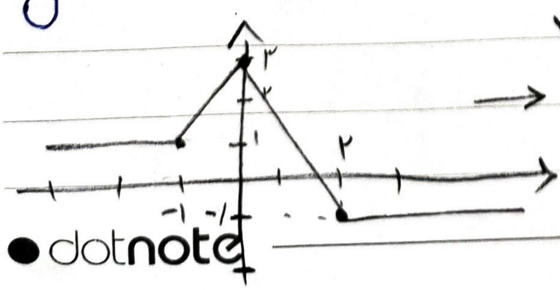
$\begin{array}{c} -2 \quad 3 \\ + \quad - \quad + \end{array}$, (2) $-x^2<x+6 \to x^2+x+6>0 \to b^2-4ac=\Delta \to \Delta<0$

$|x-\alpha|<\beta \to -\beta<x-\alpha<\beta \to \alpha-\beta<x<\beta+\alpha \to -2<x<3 \to$

$\begin{cases} \alpha+\beta=3 \\ \alpha-\beta=-2 \end{cases} \to 2\alpha=1 \to \boxed{\alpha=\frac{1}{2}}$

(4) $y=|x+1|-|2x|+|x-2| \to$

	-1	0	2	
$-x-1+2x-x+2=1$		$x+1+2x-x+2=2x+3$	$x+1-2x-x+2=-2x+3$	$x+1-2x+x-2=-1$



$\to \max y + \min y = -1+3=\cancel{4}\ 2$ ۱٫۷۵

dotnote

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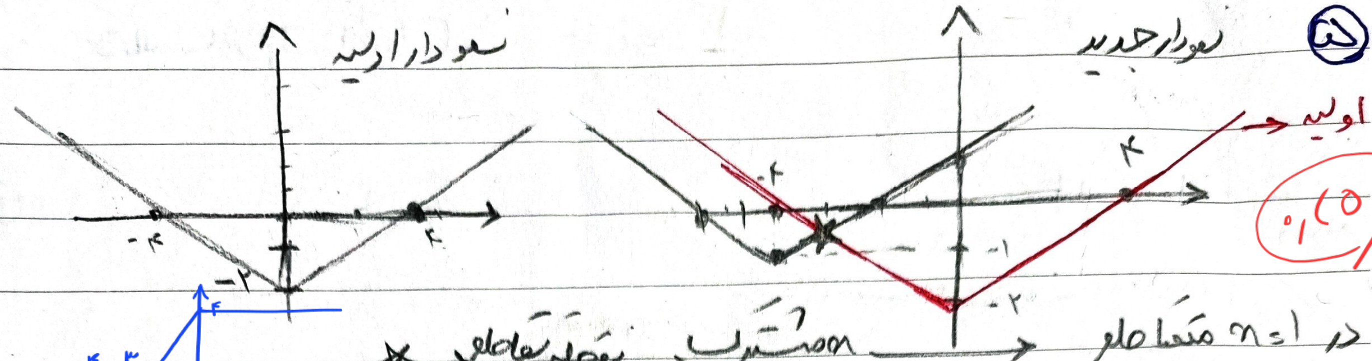

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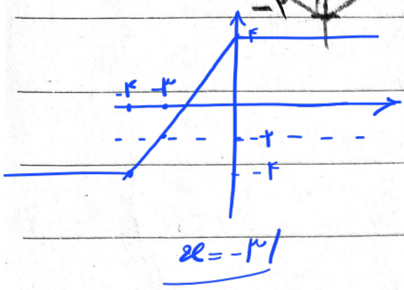

★ ← نقطه تقاطع ← مشترک ← در $x=1$ متقاطع هستند

$y' = |\frac{1}{2}x+2|-1 = y$

$|x+4|-|x| = -2$

$x = -3$

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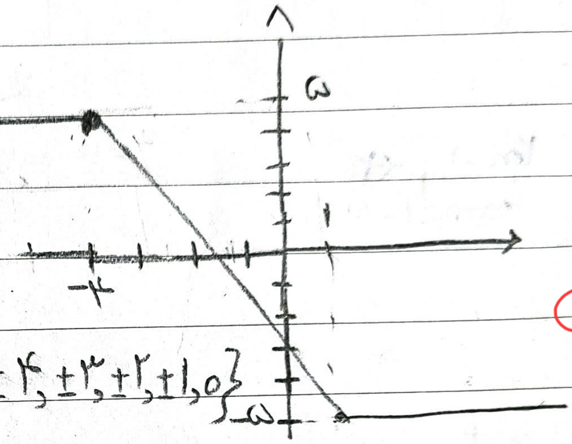

الف) $f(x) = [\overbrace{|1-x| - |x+4|}^{5}]$

تابع ابزاری

$\to f(x) = [5] \xrightarrow{\text{با توجه به نمودار}} R_f = \{\pm 5, \pm 4, \pm 3, \pm 2, \pm 1, 0\}$ -5

ب) $f(x) = \frac{1}{x} - [\frac{x+1}{x}] \to f(x) = \frac{1}{x} - [1 + \frac{1}{x}] = \frac{1}{x} - 1 - [\frac{1}{x}] \to$

$0 \le \frac{1}{x} - [\frac{1}{x}] < 1 \to -1 \le \frac{1}{x} - [\frac{1}{x}] - 1 < 0 \to R_f = [-1, 0)$

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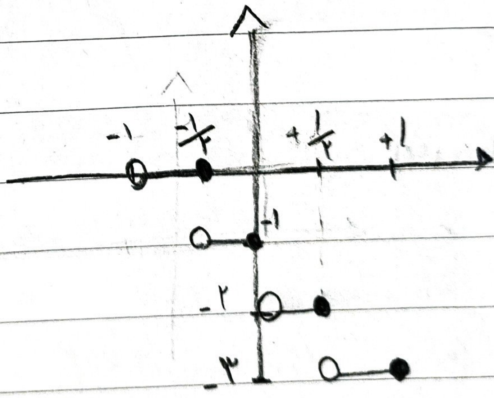

الف) $y = [-2x] - 1 \; , \; x \in (-1, 1)$

$-1 < x \le -\frac{1}{2} \to y = 0$

$-\frac{1}{2} < x \le 0 \to y = -1$

$0 < x \le \frac{1}{2} \to y = -2$

$\frac{1}{2} < x < 1 \to y = -3$

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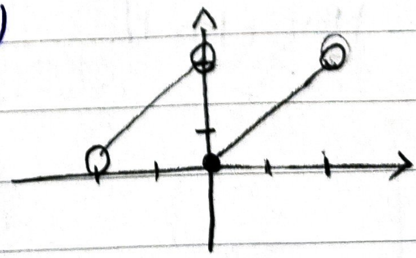
ب) $y = x - 2[\frac{x}{2}] \; , \; x \in [-2, 2)$



$-2 \le x < 0 \to y = x+2$

$0 \le x < 2 \to y = x$

ادامه:

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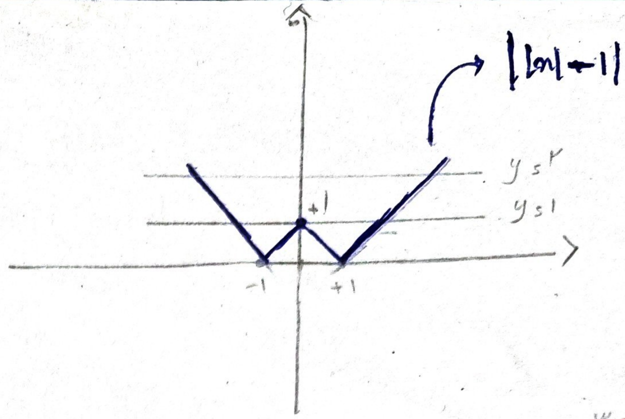
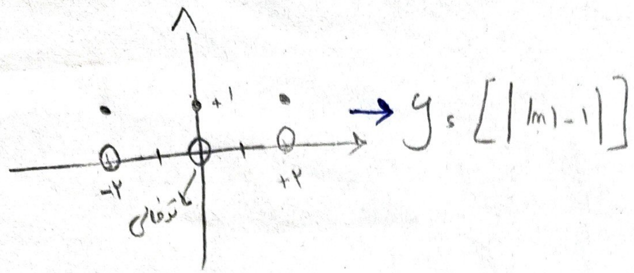
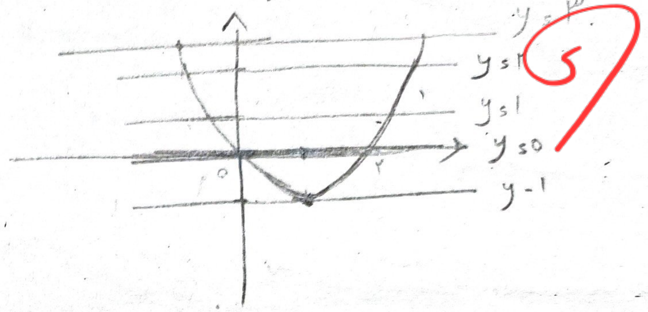
الف) $y=[||x|-1|]$, $x\in[-2,2]$



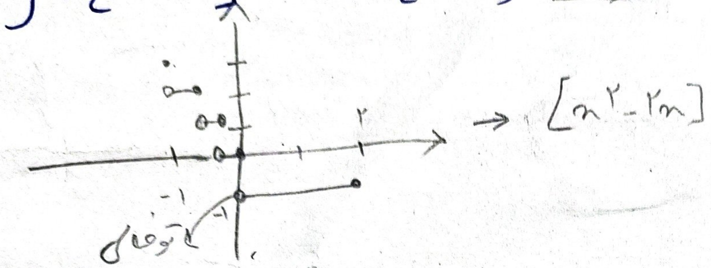
$\longrightarrow$



ب) $y=[x^2-2x]$ $x\in[-1,2]$ $\longrightarrow$



$\longrightarrow$



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$a+[b]=4{,}2 \longrightarrow [a]=x \to a=x+0{,}2 \longrightarrow x+0{,}2+y=4{,}2 \quad x+y=4$

$b-[a]=2{,}4 \longrightarrow [b]=y \to b=y+0{,}4 \to x+0{,}4-x=2{,}4 \quad y-x=2 \to$

$2y=6 \to y=3,\ x=1 \to b=3{,}4,\ a=1{,}2 \longrightarrow a+b=4{,}6$

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$1-\sqrt{2}<0 \longrightarrow (1-\sqrt{2})^6>0$

$(1+\sqrt{2})^6=198-(1-\sqrt{2})^6 \longrightarrow -1<1-\sqrt{2}<0 \longrightarrow -1<(1-\sqrt{2})^6<0 \to$

$198-1<(1+\sqrt{2})^6<198-0 \to 197<(1+\sqrt{2})^6<198 \longrightarrow [(1+\sqrt{2})^6]=197$