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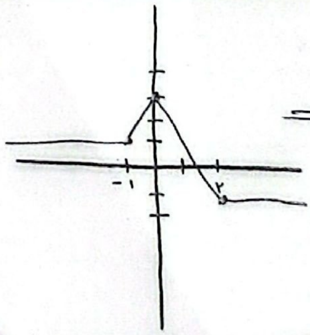
نام و نام خانوادگی ...الینا علی‌نگاری... پاسخنامه تشریحی تکلیف شماره ..۲.. کلاس ...یازدهم ریاضی B...

۱	$\frac{1}{x-1}=\lvert x-1\rvert \Rightarrow$ (1) $\frac{1}{x-1}=x-1 \Rightarrow 1=x^2-2x+1$ $\Rightarrow x^2-2x=0 \Rightarrow x(x-2)=0$ < $x=0$ غ ق ق ، $x=2$ ق ق (2) $\frac{1}{x-1}=-x+1 \Rightarrow 1=-x^2+2x-1 \Rightarrow x^2-2x+2=0 \to \Delta<0$ ریشه ندارد ۴ معادله ۱ ریشه دارد
۲	الف) $\lvert\frac{2x-1}{x}\rvert<2$ $-2<\frac{2x-1}{x}<2 \to$ (1) $\frac{2x-1}{x}<2 \to \frac{2x-1-2x}{x}<0$ $\frac{-1}{x}<0 \Rightarrow x>0$ (2) $\frac{2x-1}{x}>-2 \to \frac{2x-1+2x}{x}>0$ $\frac{4x-1}{x}>0 \to$ 0 ، $\frac14$: $+\mid-\mid+$ $\to x>\frac14$ یا $x<0$ $\cap$ $\boxed{x>\frac14}$ ب) $\lvert\frac{x-2}{2x+1}\rvert>1$ $\frac{x-2}{2x+1}>1$ یا $\frac{x-2}{2x+1}<-1$ $\frac{-x-3}{2x+1}>0$ ؛ -3 ، $-\frac12$: $-\mid+\mid-$ $\frac{3x-1}{2x+1}<0 \to$ $-\frac12$ ، $\frac13$: $+\mid-\mid+$ ۴ $\to (-3,-\frac12)\cup(-\frac12,\frac13)$
۳	$x^2<\lvert x+6\rvert \to$ $x+6>x^2 \Rightarrow x^2-x-6<0 \to (x-3)(x+2)<0 \to (-2,3)$ یا $x+6<-x^2 \Rightarrow x^2+x+6<0 \to \Delta<0$ ریشه ندارد $\Longrightarrow -2<x<3 \xrightarrow{\frac{3-2}{2}=\frac12} -\frac52<x-\frac12<\frac52 \to \lvert x-\frac12\rvert<\frac52$ ۴ $\Downarrow$ $\boxed{a=\frac12}$
۴	$y=\lvert x+1\rvert-\lvert 2x\rvert+\lvert x-2\rvert$ ؟ min, max -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 $+1$ ، 3 ، -1  $\Longrightarrow$ min $=-1$ ، max $=3$ ۴ $\boxed{\text{جمع}=2}$
۵	$y=\lvert\frac12 x\rvert-2=\frac12\lvert x\rvert-2 \xrightarrow{\text{۴ واحد به طرف x های منفی}} \frac12\lvert x+4\rvert-2 \xrightarrow{\text{۱ واحد به طرف y های مثبت}} y=\frac12\lvert x+4\rvert-1$ $\Rightarrow y=\lvert\frac12x+2\rvert-1$ $\lvert\frac12x\rvert-2=\lvert\frac12x+2\rvert-1 \Rightarrow \lvert\frac12x\rvert=\lvert\frac12x+2\rvert+1$ ۴ $\frac12x=\lvert\frac12x+2\rvert+1 \to \frac12x-1=\lvert\frac12x+2\rvert$ < $\frac12x-1=\frac12x+2$ غ ق ق ، $\frac12x-1=-\frac12x-2 \to x=-1$ غ ق ق $\frac12x=-\lvert\frac12x+2\rvert-1 \to \lvert\frac12x+2\rvert=-\frac12x-1$ < $\frac12x+2=-\frac12x-1 \to \boxed{x=-3 \text{ ق ق}}$ ، $\frac12x+2=\frac12x+1$ غ ق ق

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الف) $f(x) = [\,|-x| - |x+4|\,]$

$-4 \quad\quad 1$

$|-x+x+4| = 5 \quad | \quad |-x-x-4| = -2x-4 \quad | \quad x-1 \;;\; x \geq 4 = -5$

$R_f : \{5, 4, 3, \dots, -5\}$

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

$\frac{1}{x} - \left[1 + \frac{1}{x}\right] = \underbrace{\frac{1}{x} - \left[\frac{1}{x}\right]}_{0 \leq (\ ) < 1} - 1$

$R_f : [-1, 0)$

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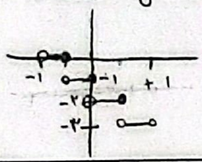
الف) $y = [-2x] - 1 \quad x \in (-1, 1) \Rightarrow -2 < -2x < 2$

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

$-1 \leq -2x < 0 \xrightarrow{[-2x] = -1} y = -2, \ 0 < x \leq \frac{1}{2}$

$0 \leq -2x < 1 \xrightarrow{[-2x] = 0} y = -1, \ -\frac{1}{2} < x \leq 0$

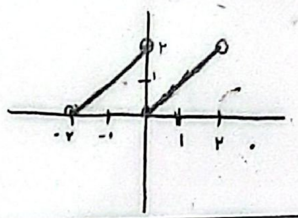
$1 \leq -2x < 2 \xrightarrow{[-2x] = 1} y = 0, \ -1 < x \leq -\frac{1}{2}$



ب) $y = x - 2\left[\frac{x}{2}\right] \quad x \in (-2, 2) \Rightarrow -1 < \frac{x}{2} < +1$

$-1 < \frac{x}{2} < 0 \xrightarrow{[\frac{x}{2}] = -1} y = x + 2, \ -2 < x < 0$

$0 \leq \frac{x}{2} < 1 \xrightarrow{[\frac{x}{2}] = 0} y = x, \ 0 \leq x < 2$



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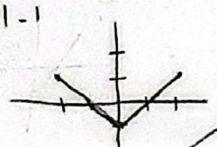
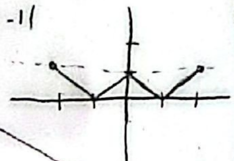
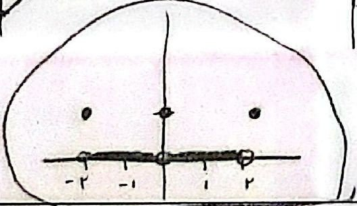
الف) $y = [\,||x| - 1|\,] \;;\; x \in [-2, 2]$

$|x| - 1$



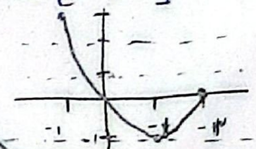
$\longrightarrow \quad ||x| - 1|$

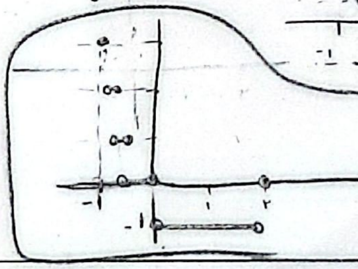




ب) $y = [x^2 - 2x] \;;\; x \in [-1, 2]$

$x^2 - 2x : [-1, 3]$





$[x^2 - 2x]$

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$a + [b] = 4.2 \qquad b - [a] = 2.4 \qquad a + b$

$\underbrace{[a] + [b] = 4 \qquad [b] - [a] = 2}_{+}$

$[b] = 3 \ , \ [a] = 1$

$b - 1 = 2.4 \to b = 3.4$

$a + 3 = 4.2 \to a = 1.2$

$\Longrightarrow a + b = 3.4 + 1.2 = \boxed{4.6}$

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$(1+\sqrt{2})^6 + (1-\sqrt{2})^6 = 198 \qquad [(1+\sqrt{2})^6] = ?$

$(1+\sqrt{2})^6 = 198 - (1-\sqrt{2})^6$

$[(1+\sqrt{2})^6] = [198 - (1-\sqrt{2})^6] = [(1+\sqrt{2})^6] = 198 + [-\underbrace{(1-\sqrt{2})^6}_{-0.04}]$

$\underset{-1 < -(1-\sqrt{2})^6 < 0}{\xrightarrow{0 < (1-\sqrt{2})^6 < 1}} [-(1-\sqrt{2})^6] = -1 \Rightarrow [(1+\sqrt{2})^6] = 198 - 1 = \boxed{197}$