جزوه شریفی سری بیستم (۱۸۵) سطح A

سوال ۱:

$\frac{1}{n-1} = |n-1| \rightarrow \frac{1}{t} = |t| \rightsquigarrow \frac{1}{t^2} = t^2 \rightarrow t^2 - \frac{1}{t^2} = 0$

$t^4 - 1 = 0 \rightarrow (t^2-1)(t^2+1) = 0 \rightarrow (t-1)(t+1)(t^2+1) = 0$ (۵)

$((n-1)-1)((n-1)+1)((n^2+1-2n+1) = 0 \rightarrow (n-2)(n)(n^2-2n+2) = 0$

$n=2$ $n=0$ $n<0$

$n=0 \rightarrow \frac{1}{0-1} \neq |0-1|$ غ ق ق

$n=2 \rightarrow \frac{1}{2-1} = |2-1|$ ق ق

یک ریشه دارد

سوال ۲:

الف) $\left|\frac{2n-1}{n}\right| < 2 \rightsquigarrow -2 < \frac{2n-1}{n} < 2$ (۱٫۷۵)

$\frac{2n-1}{n} < 2 \rightsquigarrow \frac{2n-1-2n}{n} < 0 \rightsquigarrow \frac{-1}{n} < 0 \rightsquigarrow \frac{1}{n} > 0$ $(0, +\infty)$

$-2 < \frac{2n-1}{n} \rightsquigarrow 0 < \frac{2n-1}{n} + 2n \Rightarrow \frac{4n-1}{n} > 0 \rightsquigarrow$ $(-\infty, 0) \cup (\frac{1}{4}, +\infty)$

$D_2 = (\frac{1}{4}, +\infty)$

ب) $\left|\frac{n-2}{2n+1}\right| > 1 \rightsquigarrow \frac{n-2}{2n+1} > 1 \rightsquigarrow \frac{n-2-2n-1}{2n+1} > 0 \rightarrow \frac{-n-3}{2n+1} > 0$

$\frac{n-2}{2n+1} < -1 \rightsquigarrow \frac{n-2+2n+1}{2n+1} < 0 \rightarrow \frac{3n-1}{2n+1} < 0$

$(-3, -\frac{1}{2})$

$D_2 = (-3, \frac{1}{2}) - \{-\frac{1}{2}\}$

سوال ۳:

$n^2 < |n+4| \rightsquigarrow -n-4 < n^2 < n+4$

$n^2 < n+4 \rightarrow n^2 - n - 4 < 0$ $\Delta = +1 - 4(-4) = 17$ $\frac{+1 \pm \sqrt{17}}{2} < 3$ (۵)

$-n-4 < n^2 \rightsquigarrow 0 < n^2+n+4 \rightarrow \Delta < 0$ $a > 0$ همواره مثبت است

$(-2, 3)$

$-2 < n < 3$

$-\beta < n-\alpha < \beta \rightsquigarrow \alpha-\beta < n < \beta+\alpha$

$\alpha - \beta = -2$

$\alpha + \beta = 3$

$2\alpha = 1 \rightarrow \alpha = \frac{1}{2}$

$\beta = \frac{5}{2}$

Arman

سوال ۴:

$y = |x+1| - |2x| + |x-2|$ $x=-1$ $x=0$ $x=2$

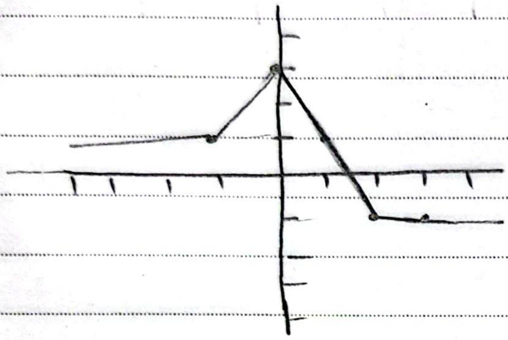
		-1		0		2	
$x+1$	−	0	+		+		+
$2x$	−		−	0	+		+
$x-2$	−		−		−	0	+

$-x-1+2x-x+2=1$ $x<-1$

$x+1+2x-x+2=2x+3$ $-1\leq x<0$

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

$x+1-2x+x-2=-1$ $x>2$



کمترین = ۱- بیشترین = ۳

$3-1=2$

سوال ۵:

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

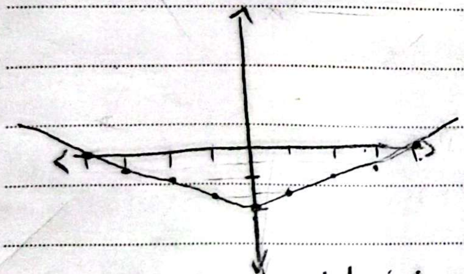
$x=0$, $x=1$: $\frac{1}{2}-2$

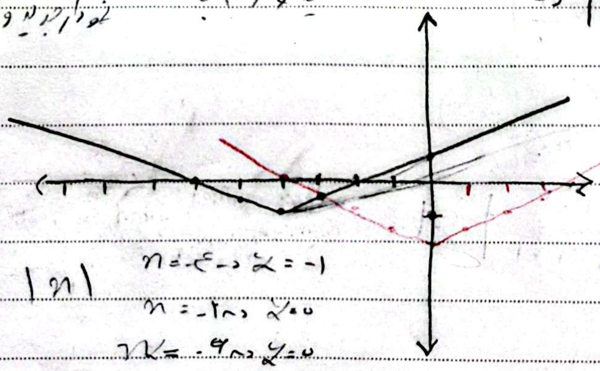
خط افقی ... نقطه تقاطع

۴ واحد به طرف x های منفی

یک واحد به پایین

$\frac{1}{2}|x+4|-1 \to |\frac{x}{2}+2|-1$





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

$\frac{x}{2}+2 = \frac{1}{2}x-1$ غ ق ق $\frac{x}{2}+2=-\frac{1}{2}x-2 \to x=-4$

سوال ۶:

الف) $f(x)=[|1-x|-|x+4|]$ $x=1$ $x=-4$

		-4		1	
$x+4$	−	0	+		+
$1-x$	+		+	0	−

$1-x+x+4=5$ $x<-4$

$1-x-x-4=-2x-3$ $-4\leq x\leq 1 \to D:[-4,1] \to$ برد $=[-5,5]$

$\{-5,-4,-3,-2,-1,0,1,2,3,4,5\}$

$x-1-x-4=-5$ $x>1$

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

$0\leq x<1$

$-1\leq x<0$

Arman

جزوه شریفی سری بیستم کلاس A

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سوال ۷:

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

$-1 < x < 1 \rightsquigarrow 2 > -2x > -2$

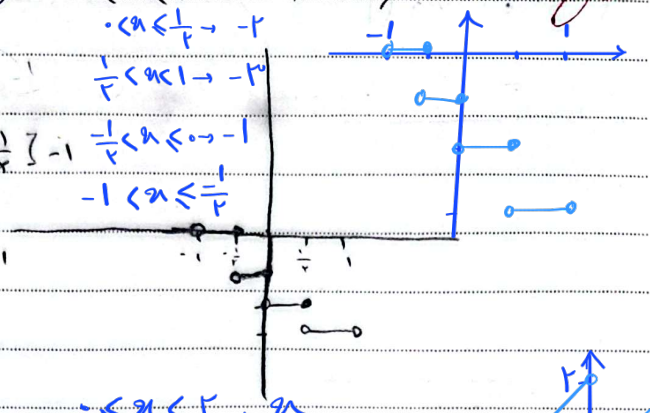
$-2 < -2x < -1 \rightsquigarrow 1 > x > \frac{1}{2} \rightsquigarrow -2$

$-1 \leq -2x < 0 \rightsquigarrow \frac{1}{2} \geq x > 0 \rightsquigarrow [-2 \times \frac{1}{2}] - 1$

$0 \leq -2x < 1 \rightsquigarrow 0 \geq x > -\frac{1}{2} \rightarrow [-2 \times 0] - 1$

$1 \geq -2x < 2 \rightsquigarrow -\frac{1}{2} \geq x > -1$

$\rightarrow [-2 \times \frac{1}{2}] - 1 = -2$



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

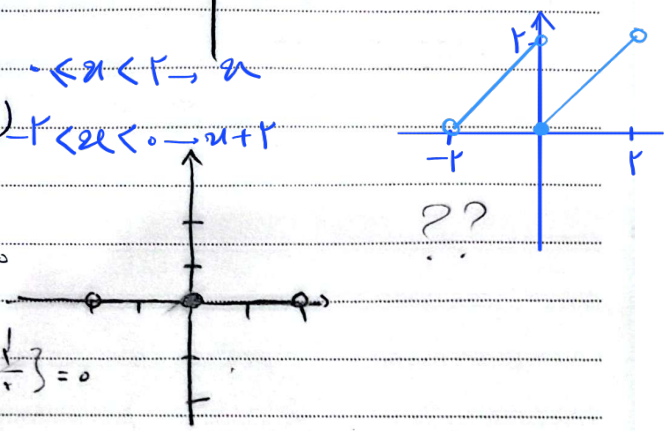
$-2 < x < 2 \rightsquigarrow -1 < \frac{x}{2} < 1$

$-1 < \frac{x}{2} < 0 \rightsquigarrow -2 < x < 0$

$0 < \frac{x}{2} < 1 \rightsquigarrow 0 < x < 2 \rightarrow 2 - 2[\frac{1}{2}] = 0$

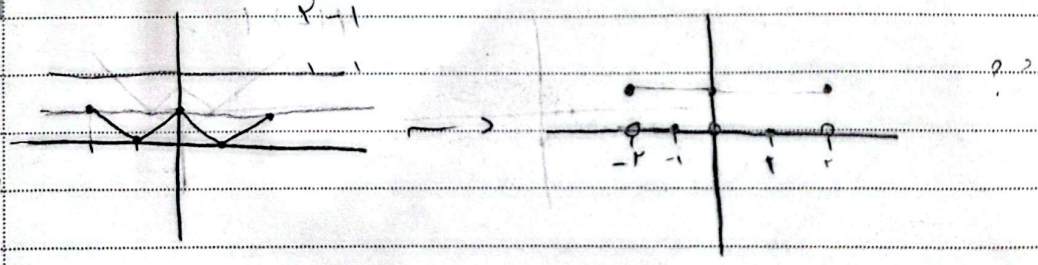
$-2 < x < 0 \rightarrow x + 2$

$-2 < x + 2 < 2$



سوال ۸:

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

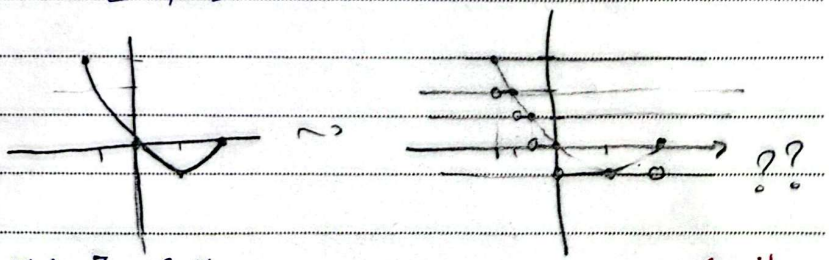


ب) $y = [x^2 - 2x] \quad x \in [-1, 2]$

$x^2 - 2x \rightsquigarrow 1 + 2 = 3$

$2 \cdot 0 = 0$

$1 - 2 = -1$



سوال ۹:

$[b] - [a] = 2,4 \quad a + [b] = 4,2$

$[b] - [a] = 2$

$[a] + [b] = 4$

$2[b] = 6$

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

$b = 3,4$

$a = 1,2$

$a + b = 4,6$

1,75

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$\hookrightarrow + \sqrt{2} \quad + 2\sqrt{2}$

سوال ۱۰:

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

$[1-\sqrt{2}] = -1 < x < 0 \rightarrow (1+\sqrt{2})^6 = 197$

$\hookrightarrow [(1+\sqrt{2})^6] = 197$