

الف) $y = \frac{x+1}{x-2}$
 $x=0 \Rightarrow y = -\frac{1}{2}$
 نقاط: $x=2 \rightarrow y=2$
 جواب: 1

$R = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$

ب) $y = \frac{|x|^2+1}{|x|} = |x| + \frac{1}{|x|}$ $R = [2, +\infty)$

$y = \frac{x^2+2x-2}{x+3} \rightarrow yx + 3y = x^2+2x-2 \rightarrow x^2 + (2-y)x - 2-3y = 0$

$b^2 \geq 4ac \rightarrow (2-y)^2 \geq 4(-2-3y) \rightarrow y^2 + 4 - 4y + 8 + 12y \geq 0$

$\rightarrow y^2 + 4 - 4y + 8 + 12y \geq 0 \rightarrow y^2 + 8y + 12 \geq 0 \rightarrow (y+4)(y+2) \geq 0$
 $R = (-\infty, -4] \cup [-2, +\infty)$

ج) $x^2-x+1 \neq 0 \rightarrow b^2-4ac = 1-4 = -3 < 0 \rightarrow$ $D = \mathbb{R}$

$x^2-x=t \rightarrow y = \frac{t+1}{t}$
 $t=0 \rightarrow y = \frac{1}{0}$

$R = \mathbb{R} \setminus \{0\}$

د) $\text{ext} \left| -\frac{b}{2a} = -\frac{1}{2} \right|$
 $-(2)^2+1-1 = -4+1-1 = -4$

$R = (-\infty, 3]$
 $R_1 = [0, \sqrt{3}]$

ه) $\text{ext} \left| -\frac{b}{2a} = 2 \right|$
 $2(2)-1(2)^2+1-1 = 4-4+1-1 = 0$

$R = [-1, +\infty)$
 $R_2 = [-2, +\infty)$

و) $\begin{vmatrix} 0 & 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 & 5 \end{vmatrix}$

$R = [-2, +\infty)$

ز) $\begin{vmatrix} 3 & 1 & 2 \\ 1 & 2 & 3 \end{vmatrix}$

$R = [4, +\infty)$

ا) $y = \log(x^2 - x + 1)$ $\rightarrow R = \mathbb{R}$

(2) 5

ب) $\frac{x+1}{x} = x + \frac{1}{x} \rightarrow R = (-\infty, -1] \cup [1, +\infty) \rightarrow R = [1, +\infty)$

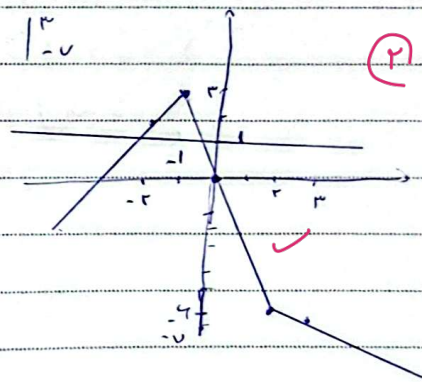
$y = |x-2| - |x+2| \leq 1$ $\begin{vmatrix} -2 \\ 2 \end{vmatrix} \begin{vmatrix} -1 \\ 1 \end{vmatrix} \begin{vmatrix} 2 \\ -2 \end{vmatrix} \begin{vmatrix} 1 \\ -1 \end{vmatrix}$

(2) 5

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

$-1 < x < 2 \rightarrow -x+2-x-2 = -2x = 1 \rightarrow x = -\frac{1}{2}$

جواب: $(-\infty, -1] \cup [-\frac{1}{2}, +\infty)$

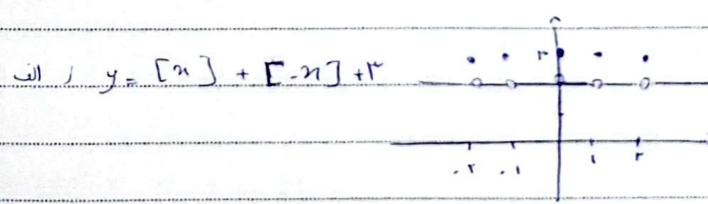


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$\frac{1}{x} + x + 1 - x = \frac{1}{x} + 1$ $\begin{vmatrix} -1 \\ 1 \end{vmatrix} \begin{vmatrix} 1 \\ -1 \end{vmatrix} \begin{vmatrix} 1 \\ -1 \end{vmatrix} \begin{vmatrix} -1 \\ 1 \end{vmatrix}$ $R = [-1, +\infty)$
 $R = (-\infty, -1]$

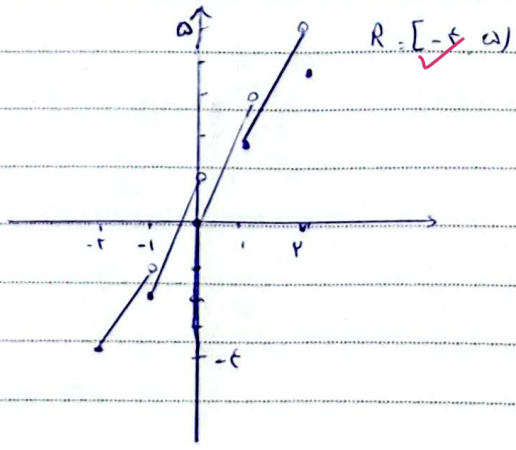
$R = \mathbb{R}$

(2) 1



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ا) $-2 < x < 1 \rightarrow [x] = -2 \rightarrow y = x + 2$
 $-1 < x < 0 \rightarrow [x] = -1 \rightarrow y = x + 1$
 $0 < x < 1 \rightarrow [x] = 0 \rightarrow y = x$
 $1 < x < 2 \rightarrow [x] = 1 \rightarrow y = x - 1$
 $x = 2 \rightarrow [x] = 2 \rightarrow y = x - 2$



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ا) $\frac{b}{a} \leq \frac{1}{x} \rightarrow \frac{1}{x} - \frac{1}{x} + 1 = -\frac{1}{x} + 1 = \frac{x-1}{x}$

$R = [\frac{x-1}{x}, +\infty)$

(2) 1

ب) $\frac{1}{x} = \frac{1}{x} \rightarrow \sin^2 x = \frac{1}{x} \rightarrow \sin^2 x = \frac{1}{x}$

$R = [1, +\infty)$

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۳- خروجی کسره عوارضی نسبت است پس دامنه IR است

$$f(n) = \frac{(n - \frac{1}{r})^2}{(n - \frac{1}{r})^2 + \frac{r}{4}}$$

طرفین درمیان $\rightarrow y n^2 - y n + y = n^2 - n + \frac{1}{r} \rightarrow (y-1)n^2 - (y-1)n + y - \frac{1}{r} = 0$

$$n = \frac{y-1 \pm \sqrt{(y-1)^2 - 4(y-1)(y-\frac{1}{r})}}{2(y-1)} \rightarrow \Delta \geq 0 \rightarrow (y-1)(y-1-\cancel{4y}+4) \geq 0$$

$\frac{0}{-} \mid \frac{1}{+} \Rightarrow y = [0, 1]$

غیرب n بنایه صفر شود یعنی $y \neq 1$ است

و تابع در انزای هیچ مقداری برابر یک نیست پس برد برابر است با: $R_y = [0, 1)$

می‌توانست از روش مربع هم استفاده کنیم

$$f(n) = \frac{\square^2}{\square^2 + \frac{r}{4}}$$