

(5) (2) $y = \lg(\underbrace{n^2 - n + 1}_{y'}) \rightarrow R_{y'} = \mathbb{R} \rightarrow f_{y'}(y') = y$

چون y مقدار نسبت $\mathbb{R}$ می تواند داشت پس در دامنه y هر عددی که باشد در $(0, +\infty)$ تعریف می شود و پس y در $\mathbb{R}$ مقدار دارد است.

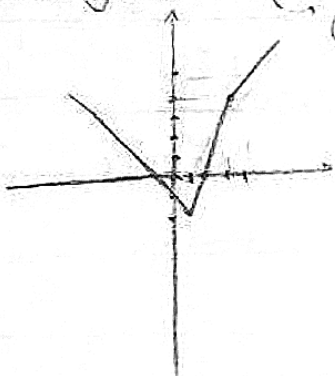
(ب) $y = \lg\left(\frac{x^2+1}{x}\right) \rightarrow y' = \frac{x^2+1}{x} = x + \frac{1}{x} \rightarrow R_{y'} = (-\infty, -2] \cup [2, +\infty)$

و طبق در این باره تعریف می شود.

(ج) $y = \lg_r = 1$

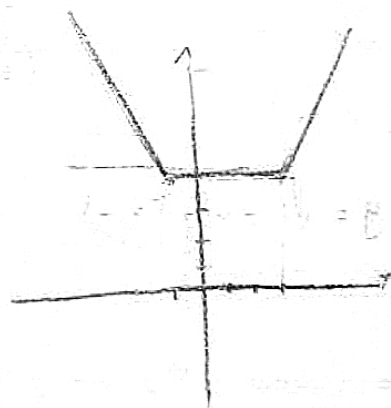
$\rightarrow R_y = [1, +\infty)$

(د) $y = |x-2| - |x-3|$



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

(6) (2) $y = |x-2| + |x+1|$



(ب) $y = |x-2| + |x+1|$

$R_y = [3, +\infty)$

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ستایش مردمی زاد دوازدهم رجب ۱۳۰۵

الف) $y = \frac{|x|+1}{|x|-2}$

$\lim_{x \rightarrow \infty} \frac{|x|+1}{|x|-2} = 1$ $\lim_{x \rightarrow -\infty} \frac{|x|+1}{|x|-2} = 1$ $\lim_{x \rightarrow 2} \frac{|x|+1}{|x|-2} = \infty$ $\lim_{x \rightarrow -2} \frac{|x|+1}{|x|-2} = -\infty$ $R_f = (-\infty, -2) \cup (2, \infty)$

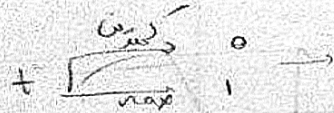
ب) $y = \frac{x^2+1}{|x|} \rightarrow |x| + \frac{1}{|x|} = y \rightarrow a + \frac{1}{a} = y \rightarrow a > 0 \rightarrow R_f = [2, \infty)$

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

$y^2 - 4y + 4 + 12 + 12y \geq 0 \rightarrow y^2 + 12y + 16 \geq 0 \rightarrow \frac{-12 \pm \sqrt{144-64}}{2} = \frac{-12 \pm 10}{2} = -1, -4$

$R_f = (-\infty, -4] \cup [-2, \infty)$

$f(x) = \frac{x^2 - x + 1/4}{x^2 - x + 1} = \frac{(x - 1/2)^2}{(x - 1/2)^2 + 3/4} \rightarrow t = x - 1/2 \rightarrow f(t) = \frac{t^2}{t^2 + 3/4}$



$[0, 2/3]$

$D_f = \mathbb{R}$ تابع همواره مثبت است

الف) $y = \sqrt{-x^2+2x-1}$ $y' = \frac{-2x+2}{2\sqrt{-x^2+2x-1}} = \frac{-x+1}{\sqrt{-x^2+2x-1}}$ $\frac{-b}{2a} = 1 \rightarrow -1+1=0$ $\lim_{x \rightarrow -\infty} y' = -\infty$ $\lim_{x \rightarrow \infty} y' = -\infty$ $(1, \infty)$

$R_{y'} = \sqrt{(-\infty, \infty)} \rightarrow R_y = [0, \sqrt{3}]$ **نکته!**

ب) $y = \sqrt[3]{2x^2-11x}$ $R_{y'} = \frac{\min}{\max} \frac{4x-11}{2} = 2 \rightarrow 4x-11=4 \rightarrow x=15/4$ $\lim_{x \rightarrow -\infty} y' = -\infty$ $\lim_{x \rightarrow \infty} y' = \infty$

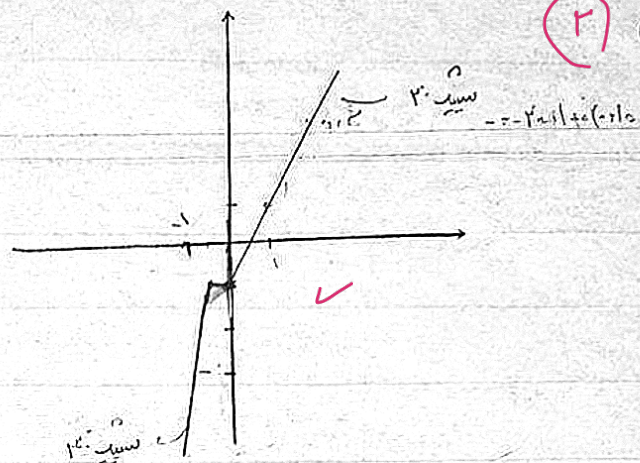
$R_y = \sqrt[3]{R_{y'}} = [-2, \infty)$

$$y = x - (x+1) + |x|$$

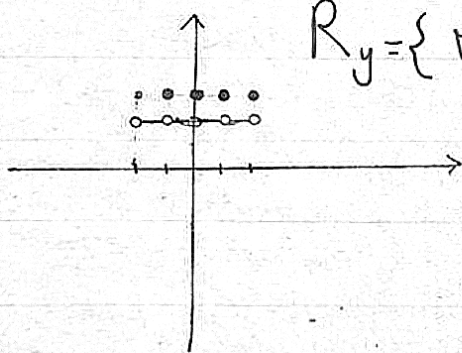
$\downarrow$ $\downarrow$
 $-\frac{1}{x}$ $\frac{1}{x}$

$$\begin{cases} x - x + 1 = 1 \\ -x - 1 + 1 = -x \end{cases}$$

$$\rightarrow R_y = \mathbb{R} \checkmark$$



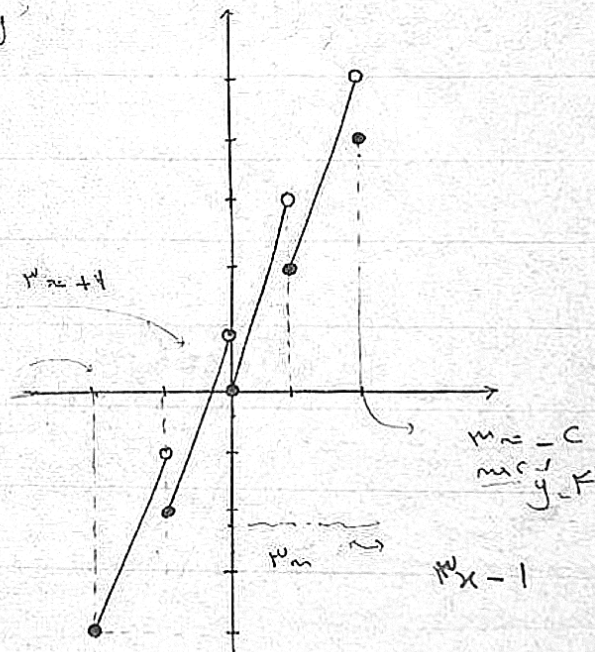
الف) $y = [m] + [x-m] = ([m] + [-m]) + x$



$$R_y = \{ \dots, m \}$$

$$\Rightarrow y = x - [m]$$

$$R = [-1, \infty)$$



$$| -x - 1 - (-x + 1) | \leq 1$$

$$i \cup \ddot{u} \cup \ddot{u} \cup \ddot{u}$$

$$\Rightarrow (-\infty, -3] \cup$$

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

$$\begin{aligned} x &\leq 1 \\ x &\leq -x \checkmark \end{aligned}$$

$$(-\infty, -x]$$

(ii)

$$\begin{aligned} x - m - x + 1 - x &\leq 1 \\ -x - m &\leq 1 \\ x &\geq -\frac{1}{m} \checkmark \end{aligned}$$

$$m - x - x - x < 1$$

$$\begin{aligned} -x &\leq \infty \\ x &\geq -\infty \end{aligned}$$

$$[x, +\infty)$$

(ii)

الف) $y = \sin^2 x - \sin x + 1$

$\sin x \begin{matrix} \text{max} & 1 - 1 + 1 = 1 = y \\ \text{min} & 1 + 1 + 1 = 3 = y \end{matrix}$

$\left(-\frac{b}{2a} \right) \frac{1}{4} - \frac{1}{4} + 1 = \frac{3}{4} = y$

$Ry = \left[\frac{3}{4}, 3 \right]$

(2)

ب) $y = \sin^2 x + \sin x + 1$

$\sin x \begin{matrix} \text{max} & 1 + 1 + 1 = 3 \\ \text{min} & 1 \end{matrix}$

$\left(-\frac{b}{2a} \right) = -\frac{1}{2} \text{ غير موجود}$

$\rightarrow Ry = [1, 3] \quad [0, -1] + [1, 1] = 0$