

14, 15

تالیف سوال

((14, 15))

تالیف سوال

1) $y = x^3 - 3x^2 + 3x - 1 + 1 \rightarrow y = (x-1)^3 + 1 \rightarrow R_y = \mathbb{R}$ (سوال 1)

2) $y = \frac{1}{x^2 - 2x} \rightarrow yx^2 - 2yx - 1 = 0 \rightarrow \Delta = 4y^2 - 4y(-1) = 4y^2 + 4y$

$\Delta \geq 0 \rightarrow \frac{4y^2 + 4y}{4y} \geq 0 \rightarrow y^2 + y \geq 0 \rightarrow y(y+1) \geq 0$
 $y \neq 0 \rightarrow y \geq -1$
 $\therefore R_y = \mathbb{R} - (-1, 0]$

3) $y = x^2 - 4x + 10 \rightarrow x_s = -(-4)/2 = 2 \rightarrow y_s = 4 - 8 + 10 = 6$ (سوال 2)
 $R_y = [6, +\infty)$ (1,5)

4) $y = -x^2 + 4x + 3 \rightarrow x_s = 2 \rightarrow y_s = -4 + 8 + 3 = 7$
 $R_y = (-\infty, 7]$

5) $y = \sqrt{x^2 - 4x - 3} \rightarrow \Delta = 16 - 4(1)(-3) = 28 \rightarrow -\frac{\Delta}{4a} = -\frac{28}{4} = -7$
 (مقدار مثبت)

6) $y = \sqrt{4x - x^2} \rightarrow x_{max} = \frac{4}{2} = 2 \rightarrow y_{max} = 2 \rightarrow R_y = [0, 2]$
 $y_s = [-\sqrt{4} + \infty)$

7) $R_y = \mathbb{R}$ 8) $R_y = \mathbb{R}$ 9) $R_y = [0, +\infty)$ (سوال 3)
 10) $[1, +\infty)$ (1,5)

11) $y = \frac{3x+1}{x-2} = \mathbb{R} - \{3\} = R_y$ (سوال 4)
 12) $y = \frac{2x+1}{x+1} \Rightarrow R_y = \mathbb{R} - \{2\}$

الف) $y = \sqrt{\frac{2x+4}{x+1}} \rightarrow y^2 x + y^2 = 2x+4 \rightarrow y^2 x - 2x = 4 - y^2$ (سوال 1)

$R_f = IR - \left\{ \frac{a}{c} \right\}$

$x = \frac{y^2 + 4}{y^2 - 2}$

$x(y^2 - 2) = y^2 + 4$

$y^2 - 2 \rightarrow y = \sqrt{29} - \sqrt{2} \rightarrow x = \frac{-\sqrt{2} + \sqrt{29}}{+1 - 1} +$

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$R_y = IR - [-\sqrt{29} + \sqrt{2}] \rightarrow R = (-1 + \infty) - \{\sqrt{2}\}$

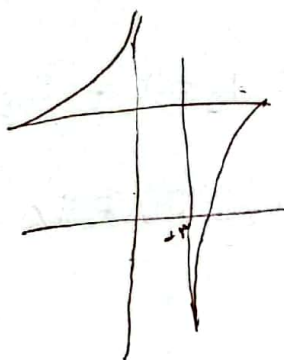
ب) $y = \sqrt{\frac{2x+1}{2-x}} \rightarrow 2y^2 - y^2 x = 2x+1 \rightarrow 2y^2 - 1 = 2x + y^2 x$

$2y^2 - 1 = x(2 + y^2) \rightarrow x = \frac{2y^2 - 1}{2 + y^2} \rightarrow x = \frac{-\sqrt{2} + \sqrt{2}}{+1 - 1} +$

$R_y = IR - \left[-\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} \right] R = \sqrt{R - \frac{1}{2}} = (-1 + \infty)$

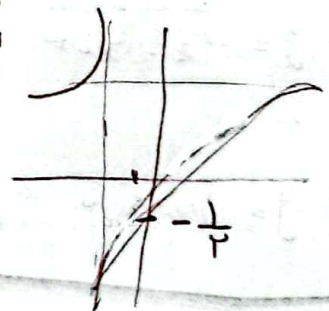
الف) $y = \frac{2x^3}{x+1}$

بجانب قائم $\rightarrow -1$
بجانب افقی $\rightarrow 2$



ب) $y = \frac{2x-1}{x+2}$ (سوال 4) 5

بجانب قائم: 2
بجانب افقی: 1



الف) $y = \sin x + \frac{1}{\sin x} \rightarrow R_y = (-\infty, -2] \cup [2, +\infty)$ (سوال 1)

ب) $y = \frac{x^4+1}{x^3} = x + \frac{1}{x^3} \rightarrow R_y = (-\infty, -2] \cup [2, +\infty)$ 5

ج) $y = \frac{\sqrt{2x^2+1}}{yx} \rightarrow \sqrt{2} + \frac{1}{\sqrt{2}x} \rightarrow R_y = (-\infty, -2] \cup [2, +\infty)$

د) $y = \sqrt{x} + \frac{1}{\sqrt{x}} \rightarrow R_y = [2, +\infty)$

د) $y = x^2 + \frac{1}{x^2 + 2x} \rightarrow x^2 + \frac{1}{x^2 + 2x} + \frac{1}{x^2} \rightarrow R_y = [\frac{1}{2}, +\infty)$ (سوال 1)

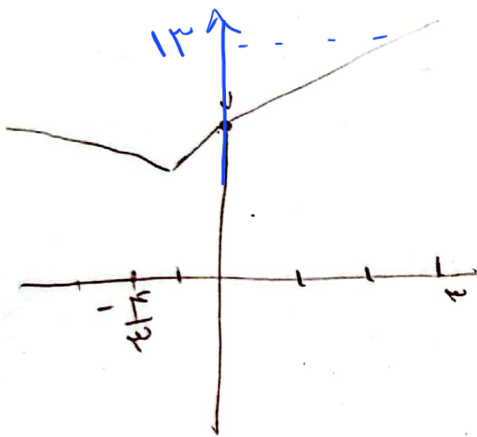
د) $y = \frac{x^2 + k + 1}{\sqrt{x^2 + k}} = \sqrt{x^2 + k} + \frac{1}{\sqrt{x^2 + k}} \rightarrow$

$\sqrt{k} + \frac{1}{\sqrt{k}} \sin = -k \min$

$\frac{\sqrt{k} + 1}{\sqrt{k}} = \frac{a}{\sqrt{k}} \times \frac{\sqrt{k}}{\sqrt{k}} = \frac{a \sqrt{k}}{k} = \frac{a x^2}{1 \cdot k} = 1 \delta$

$R_y = [1, +\infty)$

$y = |x - 3| + |3x + k| \rightarrow$



$\begin{cases} x - 3 + 3x + k \\ 3 - x + 3x + k \\ -x + 3 - 3x - k \end{cases}$

سوال 9) $x > 3$
 $\frac{k}{3} \leq x \leq 3$
 $x < -\frac{k}{3}$

د) $y = |x - 2| + |2x + 4|$

سوال 10) $y = |2x + 4| - |x + 1|$

$\begin{matrix} | & | & | \\ 0 & 2 & 4 \end{matrix}$

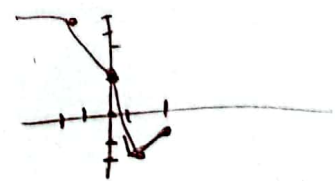
$\begin{matrix} | & | & | \\ -2 & -1 & 0 \end{matrix}$



$R_y = [2, +\infty)$

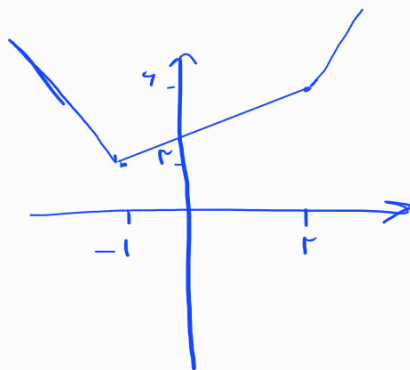
$\sqrt{8}$

$\begin{matrix} | & | & | \\ 0 & -2 & -1 \end{matrix}$
 $\begin{matrix} | & | \\ -2 & -1 \end{matrix}$



$$\begin{array}{c|c|c} -1 & & r \\ \hline -r_2 & x+r & r_2 \end{array}$$

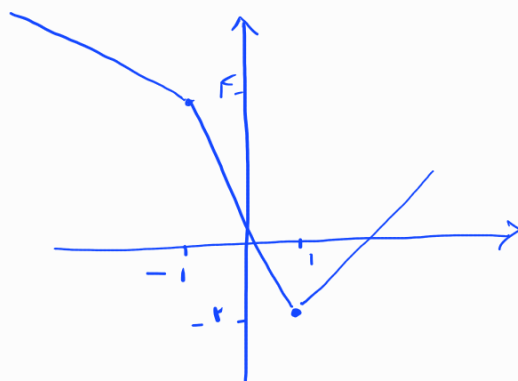
$$R = [r, +\infty)$$



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$$\begin{array}{c|c|c} -1 & & 1 \\ \hline -x+r & -r_{2+1} & x-r \end{array}$$

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



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