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تکلیف لیان ابراهیم باز هم

الف) $y = x^3 - 3x^2 + 3x$

$$x^3 - 3x^2 + 3x + 1 - 1 = (x-1)^3 + 1$$

$$x-1 = \sqrt[3]{y-1} \Rightarrow x = \sqrt[3]{y-1} + 1$$

$$R = \mathbb{R}$$

ب) $y = \frac{1}{x^2 - 2x}$

$$y(x^2 - 2x) = 1 \Rightarrow y(x^2 - 2x) = 1$$

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

$$x = \pm \sqrt{\frac{1+y}{y}} + 1$$

$$R = (-\infty, -1] \cup (0, +\infty)$$

الف) $y = x^2 - 5x + 1$

ب) $y = -x^2 + 4x + 1$

$$\min \begin{cases} x = \frac{-b}{2a} = \frac{5}{2} = 2.5 \\ \varepsilon - 1 + 1 = y \end{cases}$$

$$\max \begin{cases} x = \frac{-b}{2a} = \frac{4}{-2} = -2 \\ -9 + 16 + 1 = 8 \end{cases}$$

$$R = [4, +\infty)$$

$$R = (-\infty, 8]$$

ج) $y = \sqrt{x^2 - 5x - 14}$

د) $y = \sqrt{4x - x^2}$

$$\min \begin{cases} x = \frac{-b}{2a} = \frac{5}{2} = 2.5 \\ \varepsilon - 1 - 14 = -14 \end{cases}$$

$$\max \begin{cases} x = \frac{-b}{2a} = \frac{4}{-2} = -2 \\ 1 - 4 = -3 \end{cases}$$

$$R = \sqrt{[-14, +\infty)} = [0, +\infty)$$

$$R = \sqrt{(-\infty, 4]} = [0, 2]$$

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الف) $y = x^3 - 3x^2 + 4x + 1$ $R = \mathbb{R}$

ب) $y = x^3 - 4x^2 + 13x + 2$ $R = \mathbb{R}$

ج) $y = \sqrt{x^3 - 4x^2 + 13x + 1}$ $R = [0, +\infty)$

د) $y = (x^3 - 4x^2 + 13x + 1)^2$ $R = [0, +\infty)$

سؤال ٤ صفری بفرمایید

الف) $y = \sqrt{\frac{2x+5}{x+1}}$

مشتق

ب) $y = \sqrt{\frac{3x+1}{2-x}}$

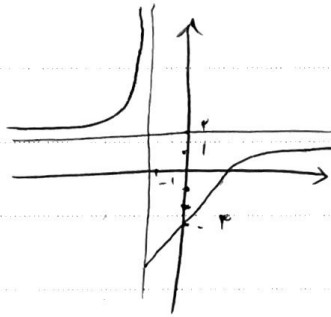
$R = \sqrt{R - \{1\}} \rightarrow [0, +\infty) - \{\sqrt{1}\}$ $R = \sqrt{R - \{-2\}} \rightarrow [0, +\infty)$

الف) $y = \frac{2x-1}{x+1}$

$x+1=0 \rightarrow x=-1$

$\frac{a}{c} = \frac{1}{1} = 1$

$x=0 \rightarrow y=-1$

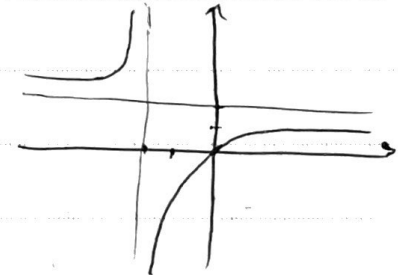


ب) $y = \frac{2x-1}{x+1}$

$x+1=0 \rightarrow x=-1$

$\frac{a}{c} = \frac{1}{1} = 1$

$x=0 \rightarrow y=-1$



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

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

ج) $y = \frac{\sqrt[4]{x^4+1}}{\sqrt[4]{x^2}} = \sqrt[4]{x^2} + \frac{1}{\sqrt[4]{x^2}}$ $R = (-\infty, -1] \cup [1, +\infty)$

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

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$$\text{الف) } y = |x-2| + |2x+2|$$

$$\begin{array}{c|c|c} & x=2 & x=-1 \\ \hline -x+2-2x-2 & -x+2+2x+2 & x-2+2x+2 \\ \hline -3x & x+4 & 3x \end{array}$$

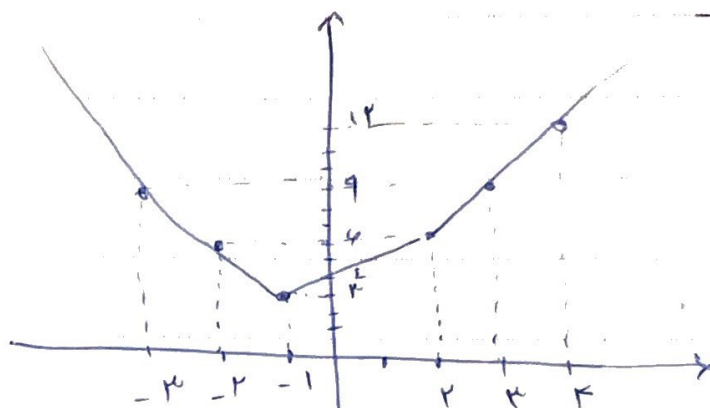
$$-2 \rightarrow -3x \rightarrow +y$$

$$-2 \rightarrow -3x \rightarrow 4$$

$$2 \rightarrow 3x \rightarrow 4$$

$$4 \rightarrow 3x \rightarrow 12$$

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



$$y = 4 \text{ بر محور } x$$

$$x = 0 \rightarrow y = 4$$

$$\text{ب) } y = |2x-2| - |x+1|$$

$$2 \rightarrow x-2 \rightarrow -1$$

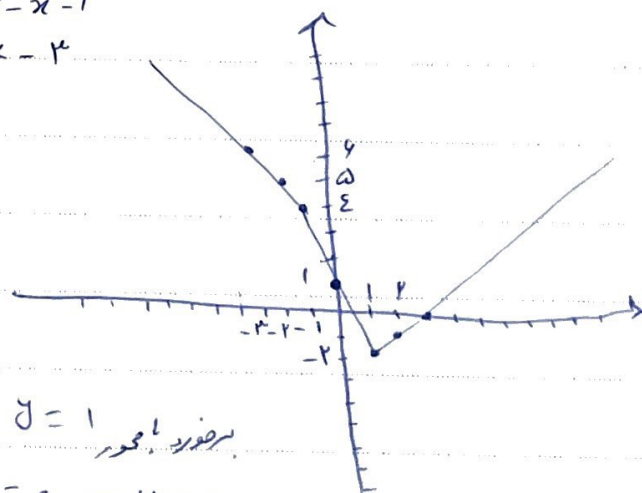
$$2 \rightarrow x-2 \rightarrow 2$$

$$-2 \rightarrow -x+2 \rightarrow 2$$

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

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

$$\begin{array}{c|c|c} & x=1 & x=-1 \\ \hline -2x+2-x-1 & -2x+2-x-1 & 2x-2-x-1 \\ \hline -3x+1 & -3x+1 & x-3 \end{array}$$



$$y = 1 \text{ بر محور } x$$

$$x = 0 \rightarrow y = 1$$