

Subject:

Year: Month: Day: ()

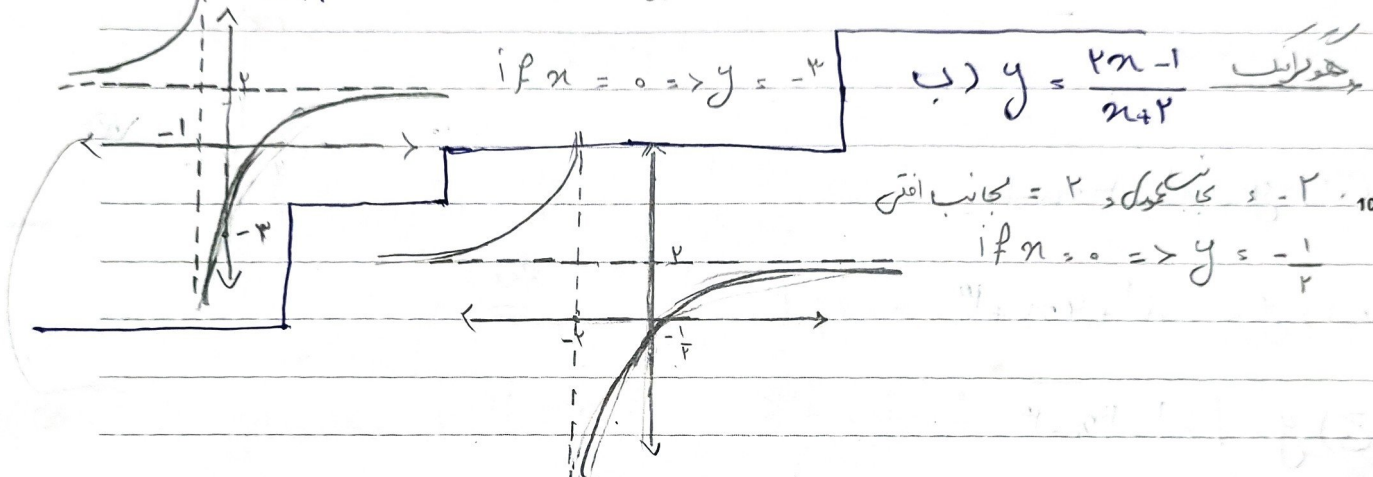
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الف) $y = \frac{2x+1}{x+1}$ $\xrightarrow{\text{جواب}} R_y = \sqrt{R - \{2\}} = [0, +\infty) - \{\sqrt{2}\}$ (4)

ب) $y = \sqrt{\frac{3x+1}{-x+2}}$ $\xrightarrow{\text{جواب}} R_y = \sqrt{R - \{2\}} = [0, +\infty)$

(4)

الف) $y = \frac{2x-1}{x+1}$ $\xrightarrow{\text{جواب}} \text{میانگین} = \frac{c}{a} = 2$, $\text{میانگین عمودی} = -\frac{b}{a} = -1$



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(V)

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

ب) $y = \frac{x^4+1}{x^3} \Rightarrow \frac{x^4}{x^3} + \frac{1}{x^3} \Rightarrow x + \frac{1}{x^3} \Rightarrow R_y = (-\infty, -2] \cup [2, +\infty)$ 20

ج) $y = \frac{\sqrt[3]{x^2+1}}{\sqrt[3]{x}} \Rightarrow \sqrt[3]{\frac{x^2}{x}} + \frac{1}{\sqrt[3]{x}} \Rightarrow \sqrt[3]{x} + \frac{1}{\sqrt[3]{x}} \Rightarrow R_y = (-\infty, -2] \cup [2, +\infty)$

د) $y = \sqrt{x} + \frac{1}{\sqrt{x}} \Rightarrow x > 0 \Rightarrow R_y = [2, +\infty)$

(25)

الف) $y = x^2 + \frac{1}{x^2+3} + 3 - 3 \Rightarrow x^2 + 3 + \frac{1}{x^2+3} - 3 \xrightarrow{\min_{x=0}} 3 + \frac{1}{3} - 3 = \frac{1}{3}$
 $\Rightarrow R_y = [\frac{1}{3}, +\infty)$

ب) $y = \frac{x^2+4+1}{\sqrt{x^2+4}} \Rightarrow \sqrt{x^2+4} + \frac{1}{\sqrt{x^2+4}} \xrightarrow{\min_{x=0}} 2 + \frac{1}{2} = \frac{5}{2}$

$\Rightarrow R_y = [\frac{5}{2}, +\infty)$

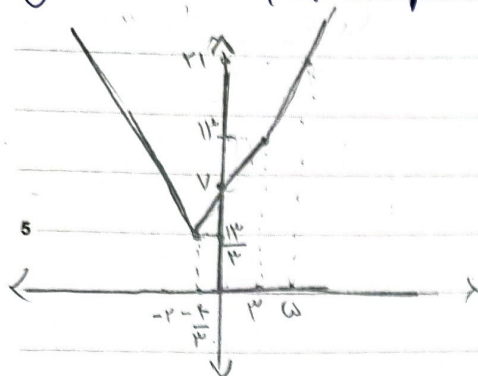
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ا) $y = |x - \frac{1}{2}| + |x + \frac{1}{2}| \Rightarrow$

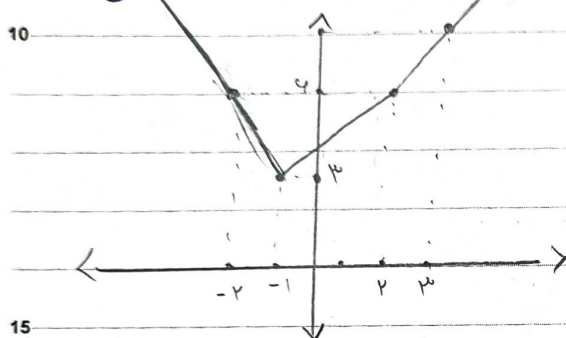


$$\begin{aligned} x &\geq \frac{1}{2} & x - \frac{1}{2} + x + \frac{1}{2} &= 2x \\ -\frac{1}{2} &\leq x < \frac{1}{2} & -x + \frac{1}{2} + x + \frac{1}{2} &= 1 \\ x &\leq -\frac{1}{2} & -x + \frac{1}{2} - x - \frac{1}{2} &= -2x \end{aligned}$$

if $x = \frac{1}{2} \rightarrow y = 1$, if $x = -\frac{1}{2} \rightarrow y = 1$

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

ب) $y = |x - 1| + |x + 1| \Rightarrow$



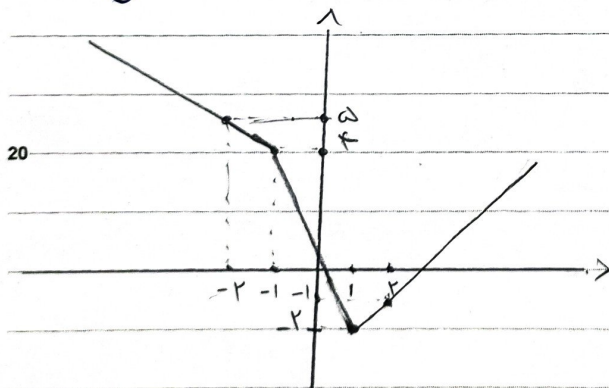
$$\begin{aligned} x &\geq 1 & x - 1 + x + 1 &= 2x \\ -1 &\leq x < 1 & -x + 1 + x + 1 &= 2 \\ x &\leq -1 & -x + 1 - x - 1 &= -2x \end{aligned}$$

if $x = 1 \Rightarrow y = 2$, if $x = -1 \Rightarrow y = 2$

if $x = 0 \Rightarrow y = 2$, if $x = 0 \Rightarrow y = 2$

$\Rightarrow R_y \subseteq [2, +\infty)$

ج) $y = |x + 1| - |x - 1| \Rightarrow$



$$\begin{aligned} x &\geq 1 & x + 1 - x + 1 &= 2 \\ -1 &\leq x < 1 & x + 1 - x - 1 &= 0 \\ x &\leq -1 & x + 1 - x - 1 &= -2 \end{aligned}$$

if $x = 1 \Rightarrow y = 2$, if $x = -1 \Rightarrow y = -2$

if $x = 0 \Rightarrow y = 0$, if $x = 0 \Rightarrow y = 0$

