

19 آفرین!

الف) $\left(\sqrt{\frac{2}{3}}, \sqrt{\frac{1}{3}} \right) = y \Rightarrow y = \left[\frac{2}{3}, \frac{1}{3} \right]$

2

ب) $\log 3 = \varepsilon + \sin \pi \rightarrow y = 1 \rightarrow \log \frac{3}{1} = \sin \pi \rightarrow \log \frac{3}{1} \leq 1$
 $\rightarrow 1 \leq y \leq 1$

1) $f(x) \geq 0$

2) $\lim_{x \rightarrow \infty} \frac{x^2 - \varepsilon}{x^2 - 9} = 1$
 $\lim_{x \rightarrow -\infty} \frac{x^2 - \varepsilon}{x^2 - 9} = \frac{4}{10}$

$x + \frac{1}{x} + 1 = \frac{5}{2}$

$R_{f(x)} = \left[\frac{4}{10}, \frac{1}{2} \right] \cup (1, +\infty)$

2

الف) $f(x) = \sqrt{\left(x + \frac{1}{x}\right)^2} + 2\sqrt{x + \frac{1}{x}} = \left(\sqrt{x + \frac{1}{x}} + 1\right)^2 \Rightarrow R_{f(x)} = [9, +\infty)$
 $\sqrt{x + \frac{1}{x}} = 0 \rightarrow \square_{\max} \rightarrow f(x) = \infty$
 $\square_{\min} \rightarrow f(1) = 2 + 2\sqrt{2}$
 $\Rightarrow R_f = [2 + 2\sqrt{2}, +\infty)$

1, 2

ب) $\varepsilon + \varepsilon \sin \pi - \sin \pi - \sin \pi = -\sin \pi + \varepsilon \sin \pi + \varepsilon = \varepsilon - \varepsilon = 0$
 $\Rightarrow R = [0, \varepsilon]$

1 $\rightarrow \frac{29}{3}$ 2 $\rightarrow \frac{21}{2} = V$

3 $\rightarrow \frac{28}{2}$

4 $\rightarrow \frac{27}{2} = 9$

5 $\rightarrow \frac{26}{2}$

6 $\rightarrow \frac{25}{2}$

7 $\rightarrow \frac{24}{2} = 12$

8 $\rightarrow \frac{23}{2}$

9 $\rightarrow \frac{22}{2}$

$\frac{29 + 28 + 27 + 26 + 25 + 24 + 23 + 22}{3} + V + 1 + 9 = Vd$

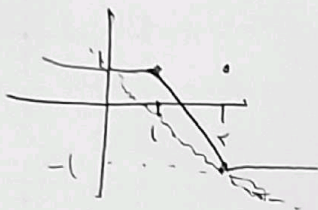
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$\sqrt{ax^2 + bx + c}$ $\begin{cases} a = 0 \\ b + c = 1 \\ 4b + c = 0 \end{cases} \Rightarrow \begin{cases} b = 1 \\ c = -5 \end{cases}$

1, 2

$g(x) = \sqrt{x^2 + \varepsilon} \rightarrow R_g = [0, +\infty) \rightarrow Rg = [0, +\infty)$

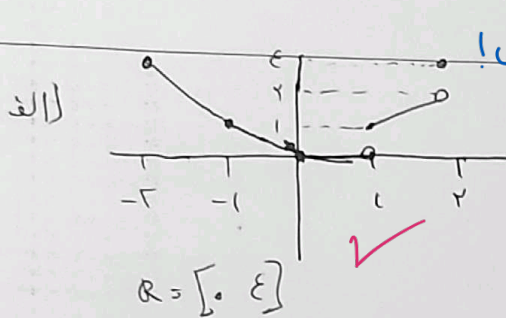
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$$k(x) = 1 \Rightarrow k = \frac{-1}{1}$$

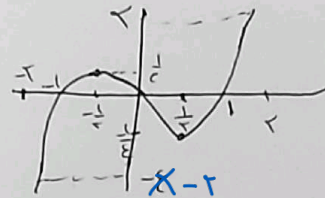
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6



دست‌نوا

$$R = [-2, 2]$$



1, 2, 3

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$$|-1|(-2) - (-2) = -2$$

$$y = \frac{2x+1}{x^2+x} = \frac{2}{x} \begin{cases} y \neq 0 \\ x \neq -1 \rightarrow y \neq -2 \end{cases}$$

$$a=0$$

$$b=-2$$

$$\frac{1}{x} = -2$$

2

8

$$f(x) = \frac{(\sqrt{x}-1)(\sqrt{x}-2)}{(\sqrt{x}-1)^2} = \frac{(\sqrt{x}-2)}{\sqrt{x}-1} \begin{cases} \frac{\infty-2}{\infty-1} = 1 \\ \frac{0-2}{0-1} = 2 \end{cases}$$

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

5

9

$$\begin{array}{r} x^2 + x^2 - x - 1 \\ -x^2 + x^2 \\ \hline 2x^2 - x - 1 \\ -2x^2 + x^2 \\ \hline -x - 1 \\ -x - 1 \\ \hline 0 \end{array}$$

$$f(x) = \frac{-x^2 - x - 1}{x+1} = \frac{-(x+1)(x+2)}{x+1} = -x-2$$

$$\begin{array}{r} -x-2 \\ -x-2 \\ \hline 0 \end{array}$$

$$-x-2 = -x-2$$

2

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