

کلاس دوازدهم پسرانه B
تکلیف شنبه ۱۴

۱۹،۵ آفرین صریح نوشتن!

رادیو مکتبی

$$y = (x - 2[x])^2 = \left(\frac{1}{2}\left(\frac{x}{2} - \left[\frac{x}{2}\right]\right)\right)^2 = \frac{1}{4}\left(\frac{x}{2} - \left[\frac{x}{2}\right]\right)^2 \rightarrow y \in [0, \frac{1}{4}] \quad (1)$$

$$-\sin x + \log y - 4 = 0 \rightarrow \log y = \sin x + 4 \rightarrow y = 10^{\sin x + 4}$$

$\rightarrow -1 \leq \sin x \leq 1 \Rightarrow y \in [10^3, 10^5]$

$$f(x) = \sqrt{\frac{x^2 - 4}{x^2 - 9}}$$

$$0 \leq x^2 < \infty \rightarrow \begin{cases} x=0 \rightarrow f(0) = \frac{2}{3} \\ (x^2 \rightarrow \infty) \rightarrow f(x) = 1 \end{cases} \xrightarrow{\text{مجموعه}} \mathbb{R}^+ \setminus \left[\frac{2}{3}, 1\right] = \left[\frac{2}{3}, 1\right] \cup (1, \infty)$$

$$a+b+c = 0 + \frac{2}{3} + 1 = \frac{5}{3} \quad \checkmark$$

$$\text{الف)} f(x) = x + \frac{1}{x} + 2\sqrt{x+1} = t^2 + 2t \rightarrow t = \sqrt{x} : y = 2 + 2\sqrt{x} \rightarrow \begin{cases} t \rightarrow \infty : y \rightarrow \infty \\ t \rightarrow 0 : y \rightarrow 2 \end{cases} \quad (2)$$

$$y \in [2 + 2\sqrt{x}, \infty) \quad \checkmark$$

$$\text{ب)} y = (3 - \sin x)(1 + \sin x) \rightarrow \begin{cases} \sin x = 1 \rightarrow y = 4 \\ \sin x = -1 \rightarrow y = 0 \\ \sin x = -\frac{b}{a} = -1 \rightarrow y = 4 \end{cases} \rightarrow y \in [0, 4] \quad \checkmark$$

$$f(x) = -\frac{1}{x}x + 1 \rightarrow \sum_{k=1}^9 f(k) = \sum_{k=1}^9 \left(-\frac{1}{k}k + 1\right) = -\frac{1}{k} \sum_{k=1}^9 k + 9 \cdot 1 = -\frac{1}{2} \cdot 9 \cdot 10 + 9 = -45 + 9 = -36 \quad (3)$$

$$D_f = [2, \infty) \rightarrow \text{دامنه تعریف است} \rightarrow f(x) = \sqrt{bx+c} \rightarrow \begin{cases} f(1) = 0 \rightarrow 2b+c = 0 \\ f(2) = 1 \rightarrow 4b+c = 1 \end{cases}$$

$\rightarrow b = 1, c = -2 \rightarrow g(x) = \sqrt{x^2 + 2} \rightarrow R_g = [2, \infty)$

$$y = |x-2| - |x-1| \rightarrow \begin{cases} 1 \leq x \leq 2 \\ 2 \leq x \leq 3 \\ x > 3 \end{cases} \quad (4)$$

$$y = kx \rightarrow \begin{cases} kx = 1 \\ 2-2x = kx \\ kx = -1 \end{cases} \rightarrow \begin{cases} x = \frac{1}{k} \\ x = \frac{2}{2+k} \\ x = -\frac{1}{k} \end{cases}$$

$\frac{2}{2+k} = -\frac{1}{k} \rightarrow 2k = -2 - k \rightarrow k = -\frac{2}{3}$

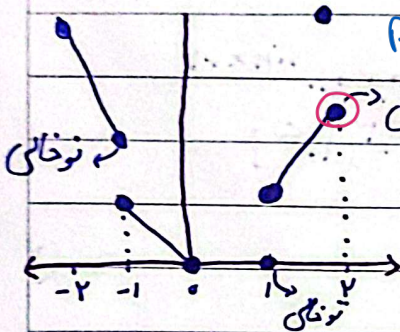
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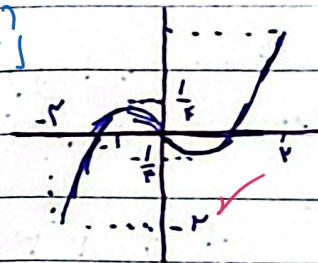
$$y = x[x]$$

$$y = x(|x| - 1) \begin{cases} x^2 - x \leq x > \\ -x^2 - x \leq x \leq \end{cases}$$

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(V)



$$Ry = [0, 2] - \{1\}$$



$$Ry = [-2, 2]$$

$$y = \frac{1}{x} + \frac{1}{x+1} + \frac{1}{x^2+x} = \frac{x+1+x+1}{x^2+x} = \frac{2x+2}{x^2+x}$$

$$\frac{y}{x} \neq 0, \quad x \neq -1 \rightarrow y \neq -2 \quad \left. \begin{matrix} a+b=-2 \end{matrix} \right\} (1)$$

$$y = \frac{x - \sqrt{x} + 3}{x - 2\sqrt{x} + 1} = \frac{(\sqrt{x}-1)(\sqrt{x}+3)}{(\sqrt{x}-1)^2} \quad x \neq 1$$

$$\frac{\sqrt{x}+3}{\sqrt{x}-1} \xrightarrow{x \rightarrow \infty} \infty, \quad x \rightarrow 1 \rightarrow y = 3, \quad x \rightarrow \infty \rightarrow y = 1$$

$$y \in (-\infty, 1) \cup [3, +\infty) \quad \checkmark$$

$$f(x) = \frac{x^3 + 3x^2 - x - 2}{x^2 - 1} = \frac{(x+2)(x^2-1)}{x^2-1} = x+2 \quad x \neq \pm 1$$

$$\left. \begin{matrix} x \neq -1 \rightarrow y \neq 1 \\ x \neq 1 \rightarrow y \neq 3 \end{matrix} \right\} 1+2=3 \quad \checkmark$$