

نام، نام خانوادگی: کامیار پوری دوازدهم تجربی پسر A پاسفنا کمالی شماره ۴

$$\text{الف)} \quad 2\left(\frac{x}{2} - \left[\frac{x}{2}\right]\right) \rightarrow 0 \leq x - 2\left[\frac{x}{2}\right] < 2 \Rightarrow 0 \leq y < 4 \Rightarrow R_f = [0, 4] \quad (1)$$

$$0 \leq \omega - [\omega] < 1 \Rightarrow \text{همواره}$$

$$\text{ب)} \quad \log y - \sin x - \varepsilon = 0 \Rightarrow \log y = \sin x + \varepsilon \quad -1 \leq \sin x \leq 1 \quad (2)$$

$$-1 \leq \sin x + \varepsilon \leq 1 \quad 10^3 \leq y \leq 10^5 \Rightarrow R_f = [1000, 100000] \quad (3)$$

$$\frac{2^x - 4}{2^x - 9} \begin{cases} \min \Rightarrow 2^x = 0 \Rightarrow \left(\frac{4}{9}\right) \\ \max \Rightarrow 2^x = \infty \Rightarrow 1 \end{cases} \sqrt{(-\infty, \frac{4}{9}) \cup (1, \infty)} \xrightarrow{\text{دایره}} \left[0, \frac{2}{3}\right] \cup [1, \infty) \quad (4)$$

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

$$\sqrt{2x + \frac{1}{2}} = t \quad t^2 + \frac{1}{2} = f(x) \quad (t+1)^2 - 1 \rightarrow (\sqrt{2x + \frac{1}{2}} + 1)^2 - 1 \quad \min = \sqrt{2} + 1 \quad (6)$$

$$\text{الف)} \quad 2 + \frac{1}{2} \geq x \Rightarrow 2 + 2\sqrt{2} \leq y < \infty \Rightarrow R = [2 + 2\sqrt{2}, \infty) \quad (7)$$

$$\text{ب)} \quad -\sin^2 x + 2\sin x + 3 = y \quad \begin{cases} \sin x = -1 \\ \sin x = +1 \\ \sin x = \frac{1}{2} \end{cases} \quad \begin{cases} y = 0 \\ y = 4 \\ y = 4 \end{cases} \Rightarrow R_f = [0, 4] \quad (8)$$

$$9 \times 10 + (-\frac{1}{3}) + (2 + (-\frac{1}{3})) + (3 + (-\frac{1}{3})) + \dots + (9 + (-\frac{1}{3})) = 90 + 8 \times (-\frac{1}{3}) = \frac{260}{3} \quad (9)$$

$$\text{جواب} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \quad \text{فکتوریل} \Rightarrow 1 \times \dots \times 9 = 362880$$

$$ax^2 + bx + c \geq 0 \quad D_f = [r + \infty) \quad a = 0 \Rightarrow x \geq -\frac{c}{b} \quad \frac{c}{b} = r \quad \frac{rb = c}{I}$$

$$f(x) = \sqrt{x^2 + c} = 1 \quad \begin{cases} rb + c = 1 \\ c = -rb \end{cases} \quad b = 1 \quad g(x) = \sqrt{x^2 + c} \Rightarrow R_g = [r + \infty)$$



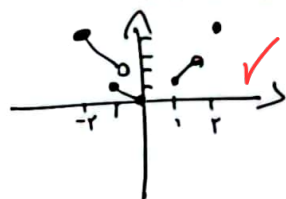
$$(r-1) \in K_2$$

$$r/k = -1 \Rightarrow k = -\frac{1}{r}$$



تابع زوج

$$f(x) = \begin{cases} x^2 & x \geq 1 \\ x & 1 < x < 2 \\ 0 & 0 \leq x < 1 \\ -x & -x < 0 \end{cases} \Rightarrow -x^2 - 2 \leq x < -1$$



$$R_f = [0, \infty) - \{r\}$$

$$g(x) = \begin{cases} x^2 - 2 & x \geq 0 \\ -x^2 - x & x < 0 \end{cases}$$



$$R_g = \mathbb{R}$$

$$R_f = [-r, +r]$$

بافتحه به بازه
بندی صورت سوال

$$\frac{r^2 + r}{x^2 + x} = \frac{r}{x} \quad x \neq -1, 0 \Rightarrow y \neq -r, 0 \quad a+b = -r$$

$$\sqrt{x} = t \quad \frac{t^2 - 4 + 4t}{t^2 - 2 + 4t} = \frac{(t-1)(t-3)}{(t-1)(t-1)} = \frac{\sqrt{x}-3}{\sqrt{x}-1}$$

$$\begin{cases} \sqrt{x} = 0 \text{ min} \\ \sqrt{x} = \infty \text{ max} \end{cases} \Rightarrow \begin{cases} y = 3 \\ y = 1 \end{cases} \Rightarrow R = (-\infty, 1) \cup [3, +\infty)$$

$$g = \frac{2x^2 + 2x + 2}{2x + 1} = x + \frac{1}{x+1} \quad x \neq -1, 1 \Rightarrow y \neq 3, 1$$

$$\Rightarrow R_f = \mathbb{R} - \{3, 1\} \Rightarrow S = x+1 = 4$$