

برای حل

۱۷/۵

تکلیف سوره ۴

« کیوان کاغذی »

$$\text{این) } y \in \left(r\left(\frac{n}{r}\right) - r\left[\frac{n}{r}\right] \right)^r \xrightarrow{\text{می دانیم}} \frac{r\frac{n}{r} - \left[\frac{n}{r}\right] < 1}{r} \rightarrow 0 < r\left(\frac{n}{r}\right) - r\left[\frac{n}{r}\right] < r \quad (1)$$

$$\xrightarrow{\text{مقدار}} 0 < \left(r\left(\frac{n}{r}\right) - r\left[\frac{n}{r}\right] \right)^r < \varepsilon \rightarrow R_F = [0, \varepsilon) \quad (2) \quad \checkmark$$

$$\text{ب) } f.g = f + \sin n \quad (1) \quad -1 \leq \sin n \leq 1 \quad (2) \rightarrow +1 \leq \sin n + \varepsilon \leq \infty$$

$$\xrightarrow{(3)} +1 \leq f.g \leq \infty \rightarrow 10 \leq y \leq 10^{\infty} \rightarrow R_F = [10, 10^{\infty}] \quad \checkmark$$

$$y = \sqrt{\frac{x^2 - \varepsilon}{x^2 - 9}} \quad \xrightarrow{\text{مقدار}} y^2 = \frac{x^2 - \varepsilon}{x^2 - 9} \rightarrow y^2 x^2 - 9y^2 = x^2 - \varepsilon \quad (3)$$

$$(y^2 - 1)x^2 + \varepsilon - 9y^2 = 0 \rightarrow x = \frac{\pm \sqrt{-\varepsilon(y^2 - 1)(\varepsilon - 9y^2)}}{2(y^2 - 1)}$$

$$r(9y^4 - 9y^2 - \varepsilon y^2 + \varepsilon) \geq 0 \rightarrow r(9y^4 - 13y^2 + \varepsilon) \geq 0 \quad \text{جمع ضرایب است}$$

$$\text{پایه ۱ و } y = \frac{\varepsilon}{9} \quad \text{جواب ۰ می شود} \quad (4) \quad \xrightarrow{\text{مثلاً}} y > 0 \rightarrow y = \pm \sqrt{\frac{\varepsilon}{9}} \rightarrow +\frac{\sqrt{\varepsilon}}{3} \text{ و } -\frac{\sqrt{\varepsilon}}{3}$$

$$\rightarrow R_F = [0, \frac{\sqrt{\varepsilon}}{3}] \cup [1, +\infty) \rightarrow a=0, b=\frac{\sqrt{\varepsilon}}{3}, c=1$$

$$\rightarrow a+b+c = 0 + \frac{\sqrt{\varepsilon}}{3} + \frac{\sqrt{\varepsilon}}{3} = \boxed{\frac{2\sqrt{\varepsilon}}{3}} \quad \checkmark$$

$$\text{این) } y = \left(\sqrt{n + \frac{1}{n}} + 1 \right)^r - 1 \quad \left(\xrightarrow{D_F = (0, +\infty)} n + \frac{1}{n} \geq 2 \rightarrow \sqrt{n + \frac{1}{n}} \geq \sqrt{2} \right)$$

$$\rightarrow \sqrt{n + \frac{1}{n}} + 1 \geq \sqrt{2} + 1 \xrightarrow{\text{مقدار}} \left(\sqrt{n + \frac{1}{n}} + 1 \right)^r \geq 3 + 2\sqrt{2} \rightarrow f(n) \geq 1 + 2\sqrt{2}$$

$$\rightarrow R_F = [1 + 2\sqrt{2}, +\infty) \quad \checkmark$$

$$\text{ب) } y = -(\sin n - 1)(\sin n + 1) = -(\sin^2 n - 1) \rightarrow y = -\sin^2 n + 1$$

$$\Rightarrow (1) \sin n = 1 \rightarrow y = -1 + 2 = 1 \quad (2) \sin n = -1 \rightarrow y = -1 - 2 = -3$$

$$(3) \sin n = \frac{r}{r} = 1 \rightarrow y = -1 + 2 = 1 \quad (1, 2, 3) \rightarrow R_F = [0, 1] \quad \checkmark$$

$n=1 \rightarrow y = \frac{19}{11} / x=2 \rightarrow y = \frac{18}{11} / x=3 \rightarrow y = \frac{17}{11} = 9 / x=4 \rightarrow y = \frac{16}{11}$
 $n=5 \rightarrow y = \frac{15}{11} / x=6 \rightarrow y = \frac{14}{11} = 8 / x=7 \rightarrow y = \frac{13}{11} / x=8 \rightarrow y = \frac{12}{11} / x=9 \rightarrow y = \frac{11}{11} = 1$
 $\Rightarrow R_f = \left\{ \frac{19}{11}, \frac{18}{11}, 9, \frac{17}{11}, \frac{16}{11}, 8, \frac{15}{11}, \frac{14}{11}, \frac{13}{11}, \frac{12}{11}, 1 \right\}$
 $S_n = \frac{1}{11} (2 \times 17 + 1 \times \frac{1}{11}) = \frac{1}{11} \times \frac{34}{11} = \frac{34}{121}$ سوال مجموع اعشاری بردار می‌دهد.

$ab = [2, +\infty) \rightarrow a=0 \rightarrow b \neq 0 \rightarrow a) -\frac{c}{b} \rightarrow -\frac{c}{b} = 1$
 $\Rightarrow f(x) = \sqrt{bx+c} = 1 \xrightarrow{x=0} \sqrt{c} = 1 \xrightarrow{b=1} \sqrt{1+c} = 1 \rightarrow b=1, c=-2$
 $c = -b$

$g(x) = \sqrt{x^2+4} \xrightarrow{x=0} g(0) = 2 \rightarrow R_f = \sqrt{[4, +\infty)} \rightarrow R_f = [2, +\infty)$

$Kx = |x-2| - |x-1|$
 $\begin{matrix} 1 & 2 \\ -x+2 & x-1 \\ -x+2 & x-1 \\ -x+2 & x-1 \end{matrix}$
 $\rightarrow K(2) = -1 \rightarrow K = -\frac{1}{2}$

$y = \begin{cases} -x & -2 \leq x < -1 \rightarrow [x] = -2 \\ -x & -1 \leq x < 0 \rightarrow [x] = -1 \\ 0 & 0 \leq x < 1 \rightarrow [x] = 0 \\ x & 1 \leq x < 2 \rightarrow [x] = 1 \\ \infty & x=2 \end{cases}$
 $R_f = [0, 2] - \{2\}$

$y = x|x| - x^2 \Rightarrow \begin{cases} x^2 - x & x > 0 \\ -x^2 - x & x < 0 \end{cases}$
 $x=0 \Rightarrow y=0$
 $x=1 \Rightarrow y=0$
 $x=-1 \Rightarrow y=0$
 $x=2 \Rightarrow y=0$
 $x=-2 \Rightarrow y=0$
 $x=3 \Rightarrow y=0$
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$y = \frac{x+x+1}{x(x+1)} = \frac{2(x+1)}{x(x+1)} \rightarrow y = \frac{2}{x} \rightarrow y \neq 0$
 $\Rightarrow R_f = \mathbb{R} - \{0, -2\} \rightarrow a, b = 0, -2 \rightarrow a+b = -2+0 = -2$

$$y = \frac{x - 4\sqrt{x} + 3}{x - 2\sqrt{x} + 1} \quad x > 0 \quad \sqrt{x} = t \quad y = \frac{t^2 - 4t + 3}{t^2 - 2t + 1}$$

(175) (9)

$$y(t^2 - 2t + 1) = t^2 - 4t + 3 \Rightarrow (y-1)t^2 + (4-2y)t + y-3 = 0$$

(x به دست می آید)

$$x = \frac{2y - 4 + \sqrt{(4-2y)^2 - 4(y-1)(y-3)}}{2(y-1)} \quad \Delta = 4y^2 - 14y + 14 - 4(y^2 - 4y + 3) \geq 0$$

$$\rightarrow 4y^2 - 14y + 14 - 4y^2 + 16y - 12 \geq 0 \rightarrow 2y + 2 \geq 0 \rightarrow y \geq -1 \quad \checkmark$$

$$\rightarrow R_f = IR \quad \frac{a \square + b}{c \square + d} \rightarrow \square_{\max} f(x) = 1 \rightarrow R_f = IR - [1, 3]$$

$$y = \frac{x^3 + 2x^2 - x - 2}{x^2 - 1} \quad \text{صورت را به عبارات ساده می کنیم} \quad \frac{x^3 + 2x^2 - x - 2}{x^2 - 1} \quad x-1 \quad x^2 + 3x + 2 \rightarrow (x+1)(x+2)$$

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

هم به تقسیم به این هم می آید 1- و 1 تعریف نمی شود.

$$\rightarrow x \neq 1, -1 \rightarrow y = x+2 \rightarrow y \neq 3, 1 \quad \text{هم به تقسیم به این هم می آید 3- و 1 تعریف نمی شود.}$$

$$\rightarrow R_f = IR - \{3, 1\} \rightarrow 3+1 = 4 \quad \checkmark$$