

دوره دوم ریاضی

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ریاضی، دوره دوم

$$f(-x) - x f(x) = r|x| + 1 \rightarrow f(-x) = r|x| + 1 + x f(x) \quad (1)$$

$$f(x) + x f(-x) = r|x| + 1$$

$$f(x) + x(r|x| + 1 + x f(x)) = r|x| + 1 - r|x| - x - x^2 f(x)$$

$$(1 + x^2) f(x) = (r|x| + 1)(1 - x)$$

$$\rightarrow f(x) = \frac{(r|x| + 1)(1 - x)}{1 + x^2} = \text{جواب}$$

$$\begin{cases} f(x) + f(0) = x^r - r x + r & f(x^r) = ? \\ x=0 \rightarrow r f(0) = r & f(0) = r \\ \rightarrow f(x) = x^r - r x + r \rightarrow f(x^r) = x^r - r x^r + r \end{cases} \quad (P)$$

$$y = \frac{x^r + x + r}{x - 1}$$

$$y x - y = x^r + x + r$$

(P)

$$x^r + x + r - y x + y = 0 \quad x^r + (1 - y) x + y + r$$

$$\Delta = (1 - y)^2 - 4(y + r) = y^2 + 1 - 4y - 4r - 1 =$$

$$y^2 - 4y - 4r$$

$$x = \frac{y - 1 \pm \sqrt{y^2 - 4y - 4r}}{y}$$

$$y^2 - 4y - 4r \geq 0$$

$$(y + 1)(y - v) \geq 0$$

$$\begin{array}{c|cc} & -1 & v \\ \hline & + & - \\ & - & + \end{array}$$

$$R_f = (-\infty, -1] \cup [v, +\infty)$$

الف) $y = 2x^2 - 4x + 1$ $\Delta = 4 - 4 = 0$ (K)
 $y_s = y_{min} = \frac{-\Delta}{4a} = \frac{-0}{4} = 0$ $R_f = [-\frac{1}{2}, +\infty)$

ب) $y = \sqrt{-x^2 + 4x - 4}$ $x_s = -\frac{b}{2a} = \frac{-4}{-2} = 2$

$y_s = y_{max} = -9 + 18 - 2 = 7 \sqrt{f(2)} \Rightarrow$

$R_f = [0, 2]$

ج) $\sqrt{x^4 - 4x^2 + 4x + 1}$ $\rightarrow$ مرتبه فرد $\rightarrow \sqrt{1R}$

$R_f = [0, +\infty)$

د) $\log(x^4 - 4x^2 + 4x + 1)$ $\rightarrow R_f = 1R$

الف) $y = \frac{3x+1}{x-4}$ $\rightarrow$ کسری $R_f = 1R - \left\{\frac{a}{c}\right\} = 1R - \left\{\frac{3}{-4}\right\} = 1R - \left\{-\frac{3}{4}\right\}$ (K)

ج) $y = \frac{x^2+3}{\sqrt{x^2+3}} = \frac{x^2+3+1}{\sqrt{x^2+3}} = \sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}}$

$x^2+3=1 \rightarrow x^2=-2$ غرض $\rightarrow \sqrt{x^2+3}$ $\rightarrow$ می تواند 1 باشد

$\min \sqrt{x^2+3} = \sqrt{3}$

$\min \sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}} = \frac{4}{\sqrt{3}}$ $R_f = \left[\frac{4}{\sqrt{3}}, +\infty\right)$

$$b) y = \sqrt{\frac{kx+1}{x-p}} \rightarrow \text{DR} = \{k\} \cup \sqrt{}$$

$$\text{RP} = [0, +\infty) - \{p\}$$

$$1) x^p + \frac{1}{x^p+k} + k - k = \frac{x^p+k}{x} + \frac{1}{x^p+k}$$

$$x^p+k=1$$

$$x^p = -k \quad \text{min } x^p+k = k \rightarrow$$

$$\text{min } x^p+k + \frac{1}{x^p+k} = k + \frac{1}{k} \rightarrow \text{RP} = \left[\frac{1}{k}, +\infty\right)$$

$$y = \frac{\mu x^p + k}{x^p - 1}$$

(4)

$$0 \rightarrow y x^p - y = \mu x^p + k \quad (\mu - y) x^p + y + k = 0$$

$$\Delta = 0 = k(\mu - y)(y + k)$$

$$x^p = \frac{\sqrt{k(y - \mu)(y + k)}}{\mu(\mu - y)} \rightarrow \geq 0$$

$$\mu(\mu - y) > 0 \rightarrow y \neq \mu$$

$$\text{RP} = (-\infty, -k] \cup (\mu, +\infty)$$

$$\text{min} = 0 \rightarrow -k \rightarrow \text{بسته} \rightarrow \text{دقیق}$$

$$\text{max} = \infty \rightarrow \mu \rightarrow \text{باز} \rightarrow \text{دقیق}$$

$$x^p - 1 = \text{من و اند صفر} \rightarrow \text{مخرج} \rightarrow (-\infty, -k] \cup (\mu, +\infty)$$

$$y = \frac{p \sin x + p}{\sin x - p}$$

(V)

$$\sin x < \begin{matrix} \min = -1 \rightarrow \frac{p}{-p} = -\frac{1}{p} \text{ بسته} \end{matrix}$$

$$\max = 1 \rightarrow \frac{p}{-p} = -1 \text{ بسته}$$

$$\sin x - p \neq 0 \rightarrow \text{مخرج نمی تواند صفر باشد}$$

$$R_f = \left[-\frac{1}{p}, -1 \right]$$

$$\text{الف) } \left| \frac{px - 1}{px} \right| \begin{cases} \text{مثبت قائم} \\ \text{منفی} \end{cases} \quad \frac{p}{x}$$

$$\text{قدر مطلق} \rightarrow R_f = [0, +\infty)$$

$$\text{ب) } \sqrt{\frac{9x - 18}{-18 + 5x}} = \sqrt{\frac{9(x-2)}{5(x-2)}} = \sqrt{\frac{9}{5}} = \frac{3}{\sqrt{5}}$$

$$R_f = \left\{ \frac{3}{\sqrt{5}} \right\}$$

$$\begin{aligned} x|x| - 2x &\rightarrow x \geq 0 \rightarrow x^2 - 2x \\ &\rightarrow x < 0 \rightarrow -x^2 - 2x \end{aligned}$$

$$R_f = \mathbb{R}$$

AZAD

