

دوره دوم ریاضی

دینا حسینی

کلاس، شماره، نام

$$f(-x) - x f(x) = 2|x| + 1 \rightarrow f(-x) = 2|x| + 1 + x f(x) \quad (1)$$

$$f(x) + x f(-x) = 2|x| + 1 \quad (2)$$

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

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

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

$$\begin{cases} f(x) + f(0) = x^2 - 3x + 4 & f(x^2) = ? \\ x=0 \rightarrow 2f(0) = 4 & f(0) = 2 \end{cases} \quad (2) \quad (3)$$

$$\rightarrow f(x) = x^2 - 3x + 2 \rightarrow f(x^2) = x^4 - 3x^2 + 2 \quad \checkmark$$

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

$$yx - y = x^2 + x + 2$$

(4) (5)

$$x^2 + x + 2 - yx + y = 0$$

$$x^2 + (1 - y)x + y + 2 = 0$$

$$\Delta = (1 - y)^2 - 4(y + 2) = y^2 + 1 - 2y - 4y - 8 =$$

$$y^2 - 4y - 7$$

$$x = \frac{y - 1 \pm \sqrt{y^2 - 4y - 7}}{2}$$

$$y^2 - 4y - 7 \geq 0$$

$$(y + 1)(y - 7) \geq 0$$

-1	7
+	-

$$R_f = (-\infty, -1] \cup [7, +\infty)$$

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

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

$R_f = [0, +\infty)$

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

الف) $y = \frac{3x+1}{2x-4}$ $\rightarrow$ کسری $R_f = 1R - \{\frac{a}{c}\} = 1R - \{\frac{3}{2}\}$ (2) (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

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

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

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

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

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

$$x^p+k=1$$

$$x^p = -k \rightarrow \min x^p+k = k \rightarrow$$

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

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

(2) (4)

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

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

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

$$\mu > y$$

$$R_f = (-\infty, -k] \cup (\mu, +\infty)$$

$$\mu < y \rightarrow x^p \rightarrow \min = 0 \rightarrow -k \rightarrow \text{بسته} \rightarrow \text{دقیق}$$

$$\mu > y \rightarrow x^p \rightarrow \max = \infty \rightarrow \mu \rightarrow \text{باز} \rightarrow \text{دقیق}$$

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

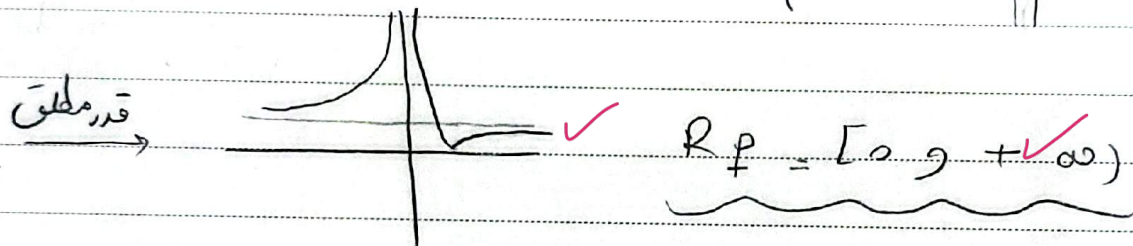
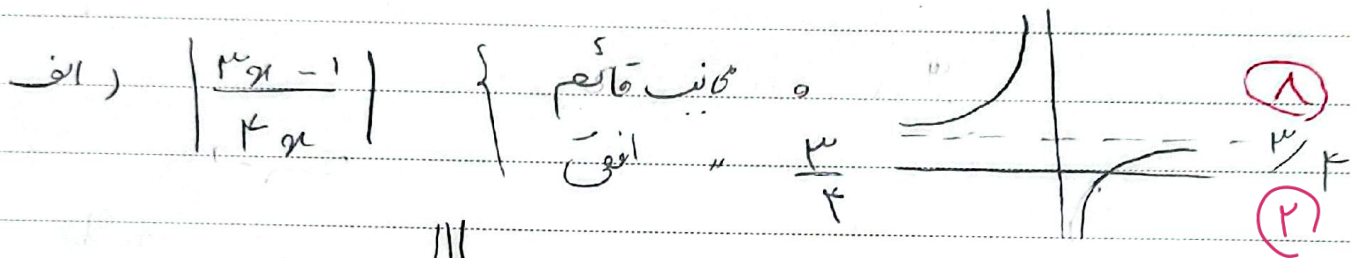
$$y = \frac{p \sin x + p}{\sin x - p}$$

(2) (7)

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

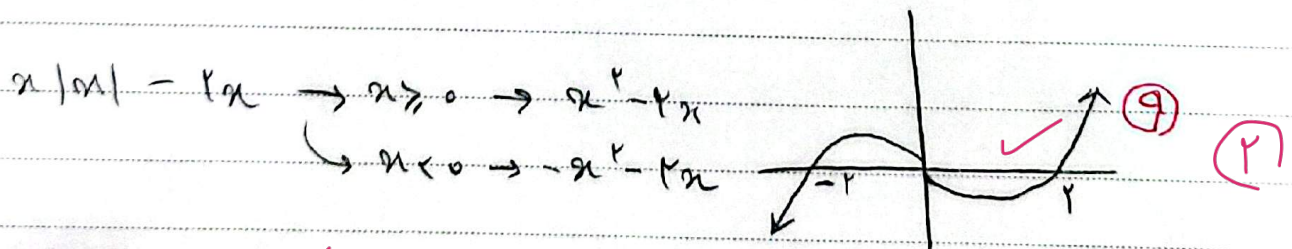
$$\sin x - p \neq 0 \rightarrow \text{مخرج دوازه} \quad R_f = \left[-\frac{1}{p}, -1 \right] \checkmark$$

مخرج نمی تواند صفر باشد



$$ب) \sqrt{\frac{9x - 18}{-1 + 5x}} = \sqrt{\frac{9(x-2)}{5(x-2)}} = \sqrt{\frac{9}{5}} = \frac{3}{\sqrt{5}}$$

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



$$R_f = \mathbb{R} \checkmark$$

