

Date:

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ترجمه بیان - دوازدهم دخترا A - تکلیف شماره ۴

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

$$F(x) = ?$$

$$\rightarrow F(-(-x)) - (-x)F(-x) = 2|-x| + 1 \rightarrow F(x) + xF(-x) = 2|x| + 1$$

$$\begin{aligned} & \xrightarrow{\text{جانب چپ} \times (-x)} F(x) + x^2 F(x) + 2x|x| + x = 2|x| + 1 \\ & \xrightarrow{\text{جانب راست} \times (-x)} F(x)(1+x^2) = 2|x| + 1 - 2x|x| - x \end{aligned}$$

$$\rightarrow F(x) = \frac{2x|x| + 2|x| - x + 1}{x^2 + 1} = \frac{-(2|x| + 1)(x-1)}{x^2 + 1}$$

$$F(x) + F(0) = x^2 - 3x + 4 \quad (2)$$

$$F(x^2) = ?$$

$$\rightarrow F(0) \rightarrow \underbrace{F(0) + F(0)}_{2F(0)} = 4 \rightarrow F(0) = 2$$

$$\rightarrow F(x) + 2 = x^2 - 3x + 4 \rightarrow F(x) = x^2 - 3x + 2$$

$$\rightarrow F(x^2) = x^4 - 3x^2 + 2$$

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

$$\rightarrow y(x-1) = x^2 + x + 2$$

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

$$\Delta \geq 0 \rightarrow 1 - 2y + y^2 - 4(2+y) \geq 0 \rightarrow y^2 - 4y - 7 \geq 0$$

$$(y-7)(y+1) = 0 \rightarrow y=7$$

$$\rightarrow y=-1$$

SPADANA

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

(K)

$$\text{الف) } y = 2x^2 - 5x + 1$$

$$x = -\frac{b}{2a} = \frac{5}{4} \rightarrow 2\left(\frac{5}{4}\right)^2 - 5\left(\frac{5}{4}\right) + 1 = \frac{2 \cdot 25}{16} - \frac{25}{4} + 1 = \frac{25 - 100 + 16}{16} = -\frac{19}{16}$$

$$\rightarrow \left[-\frac{19}{16}, +\infty\right)$$

$$\text{ب) } \sqrt{-x^2 + 9x - 5}$$

$$x = -\frac{9}{-2} = \frac{9}{2} \rightarrow -9 + 11 - 5 = \sqrt{1} = 1 \rightarrow R_f = \left[\frac{9}{2}, +\infty\right)$$

$$\text{ج) } y = \sqrt{x^4 - 3x^2 + 4x + 1} \rightarrow \text{مقدار فرد} \rightarrow \text{مقدار} = [0, +\infty)$$

$$\text{د) } y = \log(x^3 - 4x^2 + 7x + 4) \rightarrow \text{مقدار} \rightarrow \frac{R}{f}$$

مقدار 0 تا +∞ در این عبارت قرار گیرد

(L)

$$\text{الف) } y = \frac{3x+1}{2x-4} \rightarrow y(2x-4) = 3x+1 \rightarrow 2xy - 4y = 3x+1$$

$$\rightarrow x(2y-3) = 4y+1 \rightarrow x = \frac{4y+1}{2y-3} \rightarrow 2y-3 \neq 0 \rightarrow y \neq \frac{3}{2}$$

$$\text{مقدار} \rightarrow R = \left[\frac{3}{2}, \infty\right)$$

ب) $y = \sqrt{\frac{4x+1}{x-2}}$ بتكامل $y^2 = \frac{4x+1}{x-2} \rightarrow y^2(x-2) = 4x+1$
 بدلت مساوی مندر

$\rightarrow xy^2 - 2y^2 = 4x+1 \rightarrow xy^2 - 4x = 2y^2 + 1$

$x(y^2 - 4) = 2y^2 + 1 \rightarrow x = \frac{2y^2 + 1}{y^2 - 4}$

$y \neq \pm 2 \leftarrow$ چون y بر 2- و 2+ قس نمی باشد

$\rightarrow \text{بردار} = [0, 2) \cup (2, +\infty)$

ج) $y = \frac{x^2 + 4}{\sqrt{x^2 + 3}}$ $x^2 = t$ $\frac{t+4}{\sqrt{t+3}}$ $\frac{t \geq 0}{\text{محدود}} \rightarrow y_{\min} = \frac{4\sqrt{3}}{\sqrt{3}}$

$\rightarrow \text{بردار} = [\frac{4\sqrt{3}}{\sqrt{3}}, +\infty)$ $\rightarrow \frac{x^2 + 3 + 1}{\sqrt{x^2 + 3}} \rightarrow a + \frac{1}{a} \rightarrow \sqrt{3} + \frac{1}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$

د) $y = x^2 + \frac{1}{x^2 + 4}$ $x^2 = t$ $t + \frac{1}{t+4}$ $t \geq 0$ $y_{\min} = \frac{1}{4}$
 $\rightarrow \text{بردار} = [\frac{1}{4}, +\infty)$

$y = \frac{3x^2 + 4}{x^2 - 1} \rightarrow y(x^2 - 1) = 3x^2 + 4 \rightarrow yx^2 - y = 3x^2 + 4$ ⑥

$\rightarrow x^2(y-3) = y+4 \rightarrow x^2 = \frac{y+4}{y-3} \rightarrow y = -4$
 $\rightarrow y = 3$

$\rightarrow (-\infty, -4] \cup (3, +\infty)$ ①

$\frac{ax^2 + b}{cx^2 + d} \rightarrow \frac{a\Box + b}{c\Box + d}$ $\Box \geq 0$ $\Box \in [0, +\infty)$ $\Box = 0 \rightarrow y = \frac{b}{d}$
 $\Box \neq 0$ $\Box = \infty \rightarrow y = \frac{a}{c}$

$\rightarrow (-\infty, -4] \cup (3, +\infty)$

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$$F(x) = \frac{r \sin x + k}{\sin x - r} \quad \frac{-1 \leq \sin x \leq 1}{-r \leq \sin x - r \leq -1} \quad \begin{matrix} r \leq r \sin x + k \leq r \\ -r \leq \sin x - r \leq -1 \end{matrix} \quad (v)$$

$$\begin{aligned} \sin x = -1 &\rightarrow \frac{-r + k}{-r} = -\frac{1}{r} \\ \sin x = 1 &\rightarrow \frac{r + k}{-r} = -\frac{1}{r} \end{aligned} \rightarrow -r \leq y \leq -\frac{1}{r}$$

$$\rightarrow \text{بردار: } \left[-r, -\frac{1}{r}\right]$$

$$b) y = \sqrt{\frac{9x-11}{-11+4x}} \rightarrow y = \sqrt{\frac{9(x-2)}{4(x-2)}} = \sqrt{\frac{9}{4}} = \frac{3}{2} \rightarrow \text{بردار: } \left\{\frac{3}{2}\right\} \quad (1)$$

$$\rightarrow 4x \neq 11 \rightarrow x \neq \frac{11}{4}$$

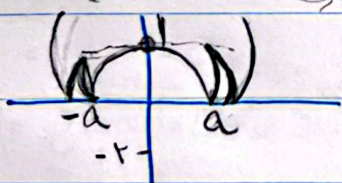
$$الف) y = \left| \frac{3x-1}{4x} \right| \rightarrow \frac{3x}{4x} - \frac{1}{4x} \rightarrow \frac{3}{4} - \frac{1}{4x} \quad y \geq 0 \rightarrow [0, +\infty) \leftarrow \text{بردار}$$

$\hookrightarrow 4x \neq 0$
 $\hookrightarrow x$ نباید صفر باشد $\leftarrow$ هر عددی جز صفر

$$y = x|x| - 2x \rightarrow \begin{aligned} x \geq 0 &\rightarrow x^2 - 2x = (x-1)^2 - 1 \\ y &\in [-1, +\infty) \\ x < 0 &\rightarrow -x^2 - 2x = 1 - (x+1)^2 \\ y &\in (-\infty, 1] \end{aligned} \quad (2)$$

ها
 $\rightarrow$ اجتماع بردار $\rightarrow (-\infty, +\infty) = \mathbb{R}$

$$y = |F(x) + 1| \rightarrow \begin{aligned} &\text{هر وقتی که بالا می رود} \\ &\text{و این } x \text{ نسبت به } x \\ &\text{قدیم} \end{aligned} \quad (10)$$



$$F(x) + 1 = 0 \rightarrow F(x) = \underline{\underline{-1}}$$