

چون اسم ندارد صفر در پیش

$$f(x) = \begin{cases} x^2 - 1 & ; x \leq 1 \\ ax + b & ; 1 < x < 2 \\ x^3 & ; x \geq 2 \end{cases}$$

$x \leq 1 \xrightarrow{1} (1) - 1 \leq (1)a + b$
 $1 < x < 2 \xrightarrow{1} a + b \leq 0$
 $x \geq 2 \xrightarrow{2} (2)a + b \leq 1$

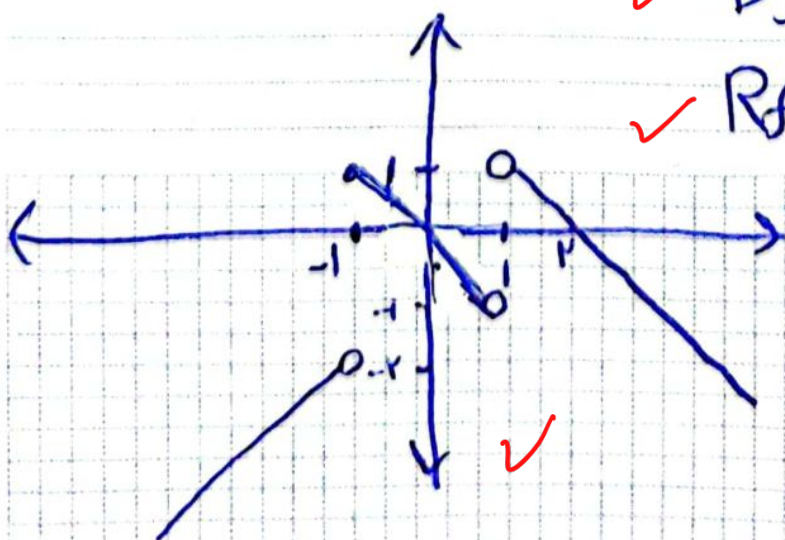
$$a \times b \leq 1 \wedge (-1) \leq (-9) \quad \checkmark \rightarrow a \leq 1 \rightarrow b \leq -1$$

$$f(x) = \begin{cases} 2x - 3 & ; x > K \\ K - 3x & ; x \leq K \end{cases}$$

$x \leq K \xrightarrow{K} 2K - 3 \leq K - 3K$
 $\rightarrow 4K \leq 3 \rightarrow K \leq \frac{3}{4}$

$$f(x) = \begin{cases} -x + 2 & ; x > 1 \\ -x & ; -1 \leq x \leq 1 \\ x - 1 & ; x < -1 \end{cases}$$

$\checkmark D_f = (-\infty, \infty) - \{1\}$
 $\checkmark R_f = (-\infty, 1]$



٤ - ٢) $2y^3 + x^2 + 150 \rightarrow 2y_1^3 + 5y_2^3$
 $2y_2^3 + x^2 + 150 \rightarrow y_1, y_2 \rightarrow$ تابع است ✓

ب) $x^2 + 4y^2 - 2x - 12y + 150$

نقطه $\rightarrow \frac{3}{2}y$ و 150 $\rightarrow (x-1)^2 + (2y-3)^2 = 50$ تابع است ✓

١٣ - ٧) $x \sin y \leq y \sin x \xrightarrow{x \leq y}$ ✓

رابطه ما تابع نیست ✓ $\rightarrow$ چنانچه y باشد $\rightarrow$

٢)

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$ $\rightarrow \frac{x}{y} + \frac{y}{x} + 2 \leq 4$ می توان می دانیم

$\rightarrow \frac{x}{y} + \frac{y}{x} \leq 2 \rightarrow \frac{x^2 + y^2}{xy} \leq 2 \rightarrow x^2 + y^2 \leq 2xy$

$\rightarrow (x-y)^2 \leq 0 \rightarrow x=y \rightarrow$ تابع است ✓

الف) $y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{x-2}{x-4}}$

Domain: $Df = [0, 3] \cup [2, 4]$ ✓

ب) $\sqrt{y-1} \leq \sqrt{3}-\sqrt{x} \rightarrow x > 0$
 $\rightarrow \sqrt{3}-\sqrt{x} > 0 \rightarrow \sqrt{3} > \sqrt{x} \rightarrow x < 3$ ✓

الف) $y = \sqrt{\frac{(x-1)(x-4)}{(x-2)(x-3)}}$

Domain: $Df = [1, 2] \cup [3, 4]$ ✓

$x - 10x + 14 = -9x + 14 > 0 \rightarrow x < \frac{14}{9}$

ب) $y = \sqrt{\frac{(x-1)(x-4)}{(x-2)(x-3)}}$

Domain: $Df = [1, 2] \cup [3, 4] \cup (1, \infty)$ ✓

الف)
$$y_5 = \frac{\sqrt{2x^2 - 4x + 3}}{\sqrt{3x^2 - 4x + 3}}$$

②

- 16

نقطة: $x^2 - 4x + 3 \geq 0 \rightarrow (x-1)(x-3) \geq 0$ $\rightarrow x \leq 1, x \geq 3$

$x^2 - 4x + 3 \geq 0$ $\rightarrow (x-1)(x-3) \geq 0 \rightarrow x \leq 1, x \geq 3$

$\rightarrow D_f = (-\infty, 1) \cup (3, \infty)$ ✓

ب)
$$y = \frac{\sqrt{2x^2 - 4x + 3}}{\sqrt{3x^2 - 4x + 3}}$$
 $\rightarrow$
$$+ \frac{1}{x-1} + \frac{1}{x-3} - \frac{1}{x}$$

$D_f = (-\infty, \frac{1}{3}) \cup (\frac{1}{3}, \infty) - \{1\}$ ✓