

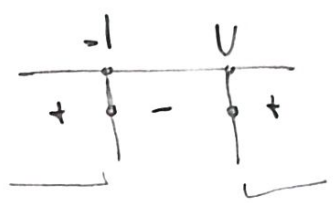
تلف ۳
دست نه! ۱۸، ۲۵

$$B_{\mu \mu \mu \mu} = G_1 \int \omega \mu_0$$

$$y = \frac{x^2 + x + 1}{x - 1} = yx - y = x^2 + x + 1 \Rightarrow x^2 + x - yx + y + 1 = 0 \Rightarrow x^2 + x(1-y) + y + 1 = 0 \quad (۲)$$

$$0 \leq y_0 \rightarrow (1-y)^2 - 4y - 1 \leq 0 \rightarrow y^2 - 4y - 1 \leq 0 \xrightarrow{\frac{4 \pm \sqrt{16+4}}{2}} y_0 = 1$$

$(-\infty, -1] \cup [y_0, \infty)$ ✓



$$x_{\min} = -\frac{b}{2a} = \frac{a}{2} \rightarrow y_{\min} = \frac{4a}{a} - \frac{4a}{2} + 1 = -\frac{14}{a} \rightarrow R_f = [-\frac{14}{a}, +\infty)$$

$$x_{\max} = -\frac{b}{2a} = 4 \rightarrow y_{\max} = -4 + 11 - a = 7 \xrightarrow{\frac{d}{dx}} R_f = [0, 7]$$

(۲ - الف) (ب)

$$\mathbb{R} \xrightarrow{\text{ایجاد}} [0, +\infty) \quad \checkmark$$

(ج) عبارت هسته زیر کمرین نه است

$\mathbb{R}$ ✓

(د) عبارت هسته زیر کمرین نه است

$$\frac{2x+1}{2x-9} \rightarrow \frac{ax+b}{cx+d} \xrightarrow{\mathbb{R} \rightarrow \frac{a}{c}} \mathbb{R} - \left\{ \frac{\mu}{\gamma} \right\} \quad \checkmark$$

(۳ - الف) (۱، ۷۵)

$$\sqrt{\frac{5x+1}{x-2}} \rightarrow \frac{b, \infty \rightarrow \frac{a}{c}}{[0, +\infty) - \{4\}} \quad \sqrt{4} = 2 \text{ دست نه}$$

$\neq (\infty) = 2$

(ب)

$$\frac{y}{x^2 + \mu} \rightarrow \frac{1}{\sqrt{x^2 + \mu}} = \sqrt{x^2 + \mu} + \frac{1}{\sqrt{x^2 + \mu}} \xrightarrow{\frac{a}{2} \leq y} \mathbb{R} = \left[\frac{\sqrt{\mu}}{\sqrt{\mu}}, +\infty \right) \quad (ج)$$

$\min = \sqrt{\mu}, \frac{1}{\mu}$

$$x^2 + \frac{1}{x^2 + 4} \rightarrow 0 \rightarrow \min x = 0 \rightarrow 0, 2 \infty \rightarrow [2, \infty)$$

(د)

$$x^2 y - y^2 x^2 + x \rightarrow x^2 \cdot \frac{y+x}{y-x} \quad x = \pm \sqrt{\frac{y+x}{y-x}}$$

$$\frac{-x}{-x} \rightarrow \text{Rf}(-\infty, -x] \cup (x, +\infty)$$

$$\min x^2 = 0 \rightarrow -x \quad \max x^2 = \infty \rightarrow x \quad \text{Rf}(-\infty, -x] \cup (x, +\infty)$$

$$y \sin x \leq y \leq x \sin x - 1 \rightarrow \sin x = \frac{y-1}{y-x} \rightarrow -1 \leq \frac{y-1}{y-x} \leq 1$$

$$-1 \leq \sin x \leq 1$$

$$0 \leq \frac{y-1}{y-x} \rightarrow \left[-\frac{x}{y}, y\right)$$

$$-\frac{y-1}{y-x} \leq 0 \rightarrow (-\infty, \frac{1}{x}] \cup (y, +\infty)$$

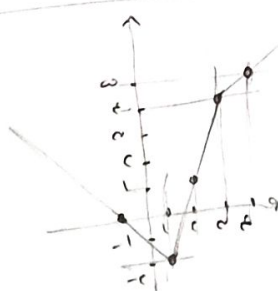
$$\text{Rf} \left[-\frac{x}{y}, \frac{1}{x}\right]$$

$$\min \sin x = -1 \rightarrow -\frac{x}{y} \quad \left[-\frac{x}{y}, \frac{1}{x}\right]$$

$$\max \sin x = 1 \rightarrow \frac{1}{x}$$

$$\frac{(x-\frac{1}{y})^2}{(x-\frac{1}{y})^2 + \frac{x}{y}} \rightarrow (x-\frac{1}{y})^2 \Rightarrow \max = 1, \min = 0 \quad \text{Rf}([0, 1])$$

$$\text{Rf} \cdot x - x + 1 \rightarrow \text{Rf} = \mathbb{R}$$



$$|x-2| - |x-1|$$

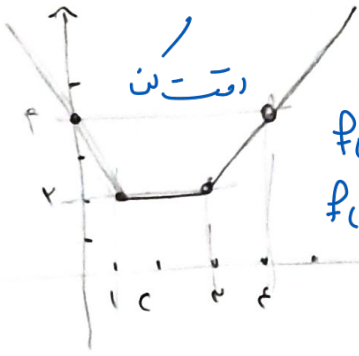
$$\text{Rf}(-1, +\infty)$$

(الف - v)

الف) ١, ٢, ٣

ب)

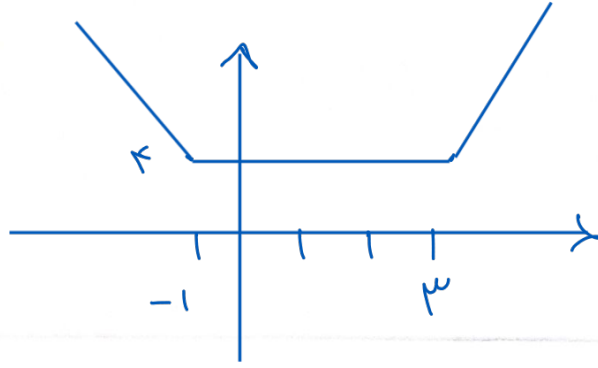
١, ٢, ٣



$$f(2) = 2$$

$$f(-1) = 2$$

$$|x-2| + |x+1| \rightarrow R_f = [2, +\infty)$$



-1 2

$-x + 2 \leq x + 1$	$-x + 2 - x \leq 1$	$-2x \leq -1$
$x \leq 1$	$-2x \leq -1$	$x \geq \frac{1}{2}$
$x \leq -3$	$x \geq -\frac{1}{2}$	

$$x \in (-\infty, -3] \cup [-\frac{1}{2}, +\infty)$$

$$x \in (-\infty, -3] \cup [-\frac{1}{2}, 2] \cup [2, +\infty)$$

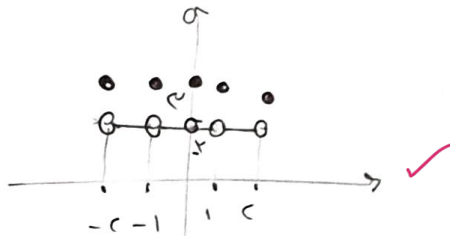
-1

١, ٢

د) $x \in \mathbb{R}$ $\rightarrow$ انبساط كامل

$$[x], [x-2] = y$$

$$R_f = \{2, 3\}$$

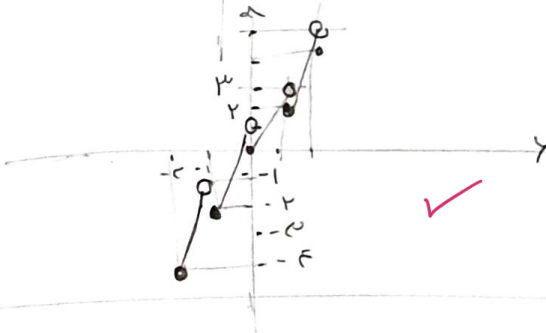


الف) ١, ٢

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$$x \in [x] = y$$

$$R_f = [-2, \infty)$$



ب)

$$\sin x \begin{cases} 1 \rightarrow 1 \\ -1 \rightarrow 2 \\ \frac{1}{2} \rightarrow \frac{3}{2} \end{cases}$$

$$R_f = [1, 3] \quad R_f = [\frac{3}{2}, 2]$$

الف) ١, ٢

١, ٢

$$\sin^2 x \begin{cases} 1 \rightarrow 1 \\ 1 \rightarrow 2 \\ -\frac{1}{2} \rightarrow \frac{3}{2} \end{cases}$$

$$R_f = [1, 3] \quad \checkmark$$