

مطلب ۳

۱. $\int \frac{1}{x} dx$

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

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

$$D_{y=0} \rightarrow (1 - y)^2 - 4(y + 1) = 0 \rightarrow y^2 - 4y - 3 = 0 \xrightarrow{\frac{4 \pm \sqrt{16 + 12}}{2}} y_0 = 1$$

$(-\infty, -1) \cup [y_0, \infty)$

$$x_{\min} = -\frac{b}{2a} = -\frac{a}{2} \rightarrow y_{\min} = \frac{4a}{a} - \frac{4a}{2} + 1 = -\frac{1}{a} \rightarrow R_f = [-\frac{1}{a}, +\infty) \quad (الف - ۲)$$

$$x_{\max} = -\frac{b}{2a} = 1 \rightarrow y_{\max} = -1 + 1 - a = -a \xrightarrow{\frac{d}{dx}} R_f = [0, 1] \quad (ب)$$

$$R_f \xrightarrow{\frac{d}{dx}} [0, +\infty)$$

(ج) عبارت هسته زیر کسری را

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(د) عبارت هسته زیر کسری را

$$\frac{ax + 1}{2x - 9} \rightarrow \frac{ax + b}{cx + d} \xrightarrow{R = \frac{a}{c}} R = \left\{ \frac{\mu}{2} \right\} \quad (الف - ۳)$$

$$\sqrt{\frac{ax + 1}{x - 2}} \rightarrow \text{" } \frac{b, \infty}{\frac{a}{c}} [0, +\infty) - \{f\} \quad (ب)$$

$$\frac{y}{x + \mu} + \frac{1}{\sqrt{x + \mu}} = \sqrt{x + \mu} + \frac{1}{\sqrt{x + \mu}} \xrightarrow{\frac{ax + 1}{a} < 2} R = \left[\sqrt{\mu}, \frac{1}{\sqrt{\mu}} \right] \quad (ج)$$

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

$$x^2 + \frac{1}{x + \mu} > 0 \rightarrow \min x = 0 \rightarrow 0, +\infty \rightarrow [x, +\infty) \quad (د)$$

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

5/10/20
-5

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

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

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

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

5/10/20 - 5

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

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

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

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

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

5/10/20

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

-9

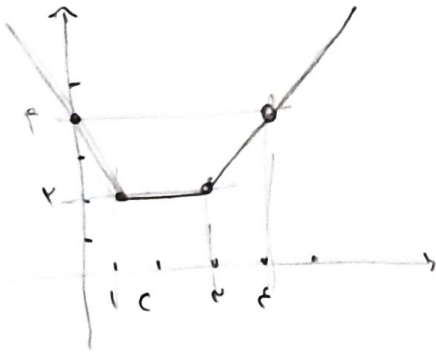
$$R_f, x^2 - x + 1 \geq 0 \rightarrow R_f = \mathbb{R}$$



$$|x-2| = |x-10|$$

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

(الف) - 10



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

مسألة ١٥

(ب)

-1 r

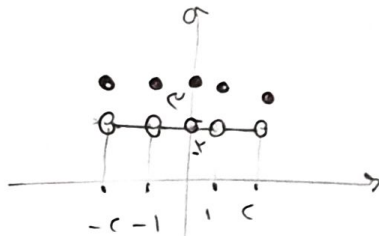
- ١

$-x + r + x + 1$	$-x + r - x - r$	$x - r - x - r$
$x \in (-\infty, -1]$	$-2x \leq 1$	$-x - r \leq 1$
$x \leq -1$	$x \geq -\frac{1}{2}$	$x \geq r$

$$x = (-\infty, -1] \cup [-\frac{1}{2}, r] \cup [r, \infty)$$

$$[x] - [x - r] = y$$

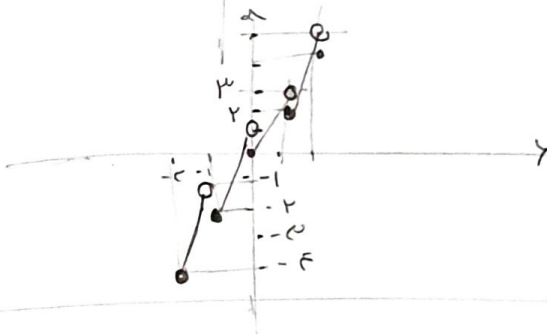
$$R_f = \{r, r\}$$



٩ - الف)

$$r[x] - [x] = y$$

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



(ب)

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

$$R_f = [1, r]$$

١ - الو)

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

$$R_f = [1, r]$$