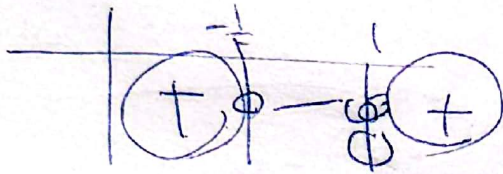


سوال الف:

$$|x| - 2y = |x| + 1$$

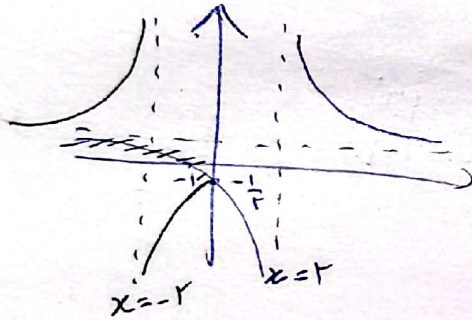
$$\rightarrow |x|(y-1) = 2y+1 \rightarrow |x| = \frac{2y+1}{y-1} \geq 0$$



$$R_f = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$$

(2)

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



y=1

$$R_f = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$$

$$y = |x| + \frac{1}{|x|} \quad (|x| = a)$$

a > 0

سوال ا-ب

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

$$y = \frac{(n^2 + 2)(n-2)}{n^2 + 2n - 2}$$

(2)

سوال 2

$$yx + 2y = x^2 + 2n - 2 \Rightarrow n^2 + x(2-y) - 2y = 0$$

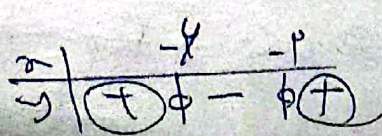
$$n = \frac{y^2 \pm \sqrt{(2-y)^2 + 4(2-y)}}{2}$$

$$x^2 + y^2 - 2y + 1 + 2y \geq 0$$

$$y^2 + 1y + 1 \geq 0$$

$$(y+2)(y+1) \geq 0$$

$$R_f: y \geq -2, y \leq -1$$

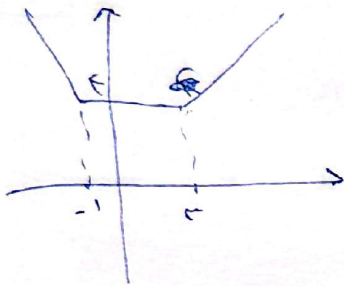
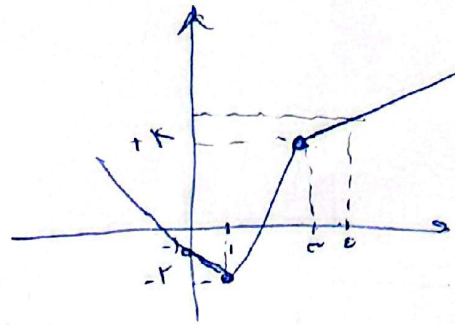


a	1	3	Σ
-1	-2	Σ	ω

(الف - 4

(2)

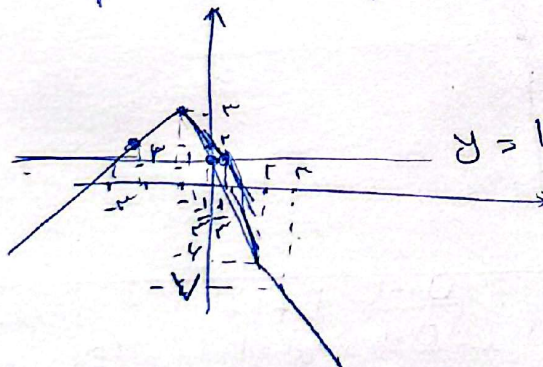
$$R_f = [-2, \infty)$$



$$R_f = [\Sigma, \infty)$$

-2	-1	2	3
$\Sigma - 2 = 2$	$+3$	-4	$1 - 1 = -1$

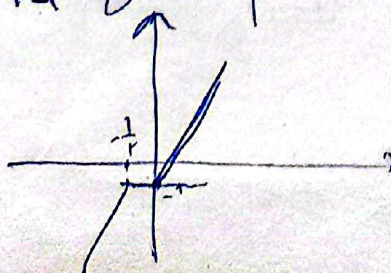
(2) - 4



$$R_f = (-\infty, 2] \cup [1, \infty)$$

$\Sigma_n - (\Sigma_{n+1}) - x$	$\Sigma_n - (\Sigma_{n+1}) - x$	$\Sigma_n - (\Sigma_{n+1}) + n$
$= \Sigma_n + 1$	$= -1$	$= \Sigma_n - 1$
$1 - \frac{1}{2}$		$1 - 1$

(2) - 1



$$R_f = (-\infty, \infty)$$

$$f(x) = \frac{(x - \frac{1}{x})^r}{(x - \frac{1}{x})^r + \frac{1}{x}}$$

$$= \frac{\boxed{x - \frac{1}{x}}}{1 + \frac{1}{x}}$$

$$\begin{cases} x=0 \rightarrow \frac{0}{0} \\ x=+\infty \rightarrow \frac{+\infty}{+\infty} = 1 \end{cases}$$

$[0, 1]$

دامنه: خروجی محدود نیست $D_f = \mathbb{R}$

ج - الف :

$$-\infty < -(x-1)^r \leq 0 \rightarrow -\infty < \sqrt{-(x-1)^r + r} \leq r \quad (2)$$

$$0 \leq \sqrt{-(x-1)^r + r} \leq r$$

$$y = \sqrt{-(x^r + \frac{1}{x} - 1)} \quad 0 \leq y \leq r \quad R_f = (-\infty, +\infty]$$

$$R_y = [0, \sqrt{r}]$$

$$3 \mid 1 \quad R_f = [-1, +\infty)$$

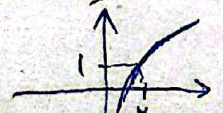
ج - ب :

$$R_y = [-1, +\infty)$$

$$g(x) = \log(x^r - x + 1) \quad f(x)$$

$$R_f = (-\infty, +\infty) \quad (1) - (2)$$

$$R_g = (-\infty, +\infty) \quad (2)$$

$$f(x) = a \cdot x + \frac{1}{x}$$


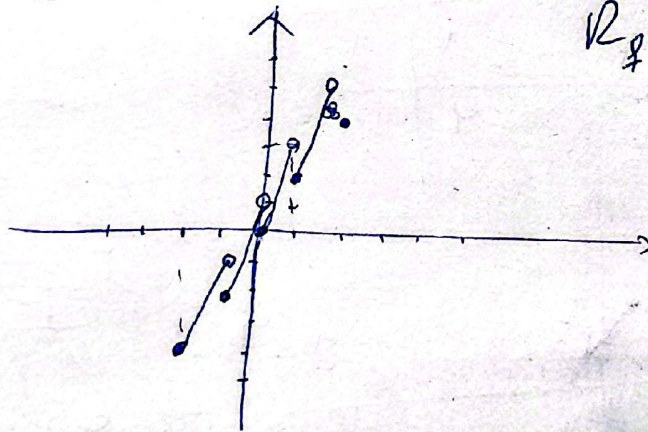
$$a > 0 \rightarrow R_f = [1, +\infty) \quad c = -a$$

$$a < 0 \rightarrow R_f = (-\infty, -1] \quad R_g = [1, +\infty)$$

$$[n] + [-n] \rightarrow \begin{cases} \rightarrow n \text{ و } 2 \\ \rightarrow n \text{ و } 2 \end{cases} \quad (9 - \text{اف}) \quad (2)$$

$$R_f = \{ \tau, \tau \}$$

$$\begin{aligned} -2 \leq x \leq -1 &\rightarrow \tau n + \tau \\ -1 \leq x < 0 &\rightarrow \tau n + 1 \\ 0 \leq x < 1 &\rightarrow \tau n \\ 1 \leq x < 2 &\rightarrow \tau n - 1 \\ x = 2 &\rightarrow \tau n - 2 \end{aligned}$$



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

$$y = \sin^2 - \square + 1 \rightarrow \begin{cases} D = -1 & 1 + 1 + 1 = 3 \\ D = 1 & 1 - 1 + 1 = 1 \\ D = \frac{1}{2} & \frac{1}{2} - \frac{1}{2} + \frac{1}{2} = \frac{1}{2} \end{cases} \quad (9 - \text{اف}) \quad (2)$$

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

$$f(x) = \sin^2 + \square + 1 \rightarrow \begin{cases} D = 1 & 1 \\ D = 1 & 1 \\ D = \frac{1}{2} & \frac{1}{2} \end{cases} \quad (9 - \text{اف})$$

$$R_f = [1, 3]$$