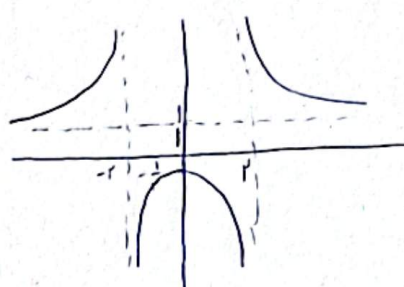


الف) $x > 0 \Rightarrow y = x + \frac{1}{x}$
 $y \geq 2$ چون (دور) قدر مطلق
 است برای متقی فاهم همین
 است $y = x + \frac{1}{x}$
 $x^2 - yx + 1 = 0$
 $x = \frac{y \pm \sqrt{y^2 - 4}}{2}$

$y \geq 2$



$R_f = \mathbb{R} - (-\frac{1}{x})$

الف)

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$x^2 + 2x - 2 = x^2 + 2y$

$x^2 + (2-y)x - (2+2y) = 0$

$x = \frac{y-2 \pm \sqrt{y^2 + 4y + 12}}{2} \Rightarrow D_y = \mathbb{R} - (-\frac{1}{x}) = R_f$

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$x^2 - x = t \Rightarrow D_t = [-\frac{1}{4}, +\infty)$
 $x = \frac{1}{2}$

$y = \frac{t + \frac{1}{4}}{t + 1} \begin{cases} t = -\frac{1}{4} & y = 0 \\ t = +\infty & y = 1 \end{cases} \quad \begin{matrix} D_f = \mathbb{R} \\ R_f = [0, 1] \end{matrix}$

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$y = \sqrt[3]{2x^2 - 11x}$
 $-\frac{b}{2a} = 2 \Rightarrow y = \sqrt[3]{-11} = -2$

$-1 \leq y < +\infty$
 $R_f = [-2, +\infty)$

(-)

الف) $f(x) = -x^2 + 6x - 1 \rightarrow -\frac{b}{2a} = 3 \Rightarrow f(x)_{\max} = 8$
 $R_{f(x)} = (-\infty, 8]$
 $R_{\sqrt{f(x)}} = [0, \sqrt{8}]$

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$D_f = (0, +\infty)$

(-)

الف) $\mathbb{R}$

$y = \log_p(x + \frac{1}{x}) \rightarrow x + \frac{1}{x} \geq 2$
 $x > 0$
 $y \geq \log_p 2$
 $y \geq 1$
 $R_f = [1, +\infty)$

$f(x) = x^3 - x + 11$

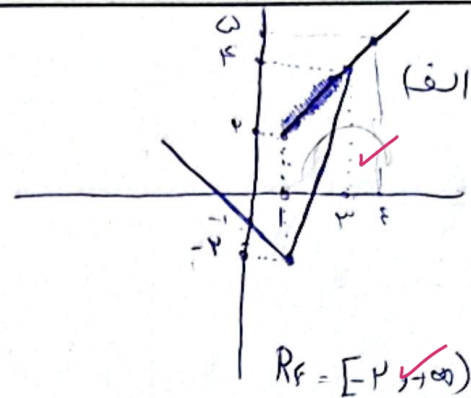
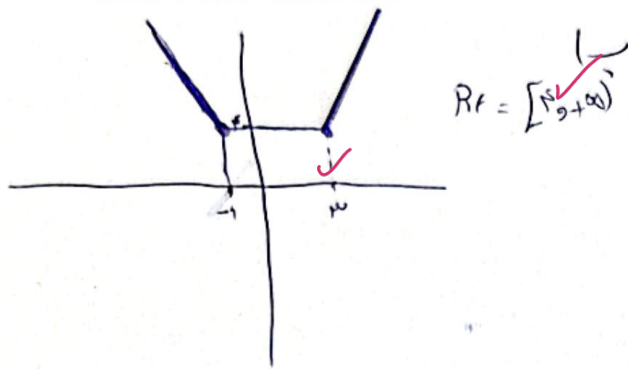
$R_f = \mathbb{R}$

$f(x) \rightarrow 0^+ \Rightarrow \log(f(x)) = -\infty$

$f(x) \rightarrow +\infty \Rightarrow \log(f(x)) = +\infty$

۲

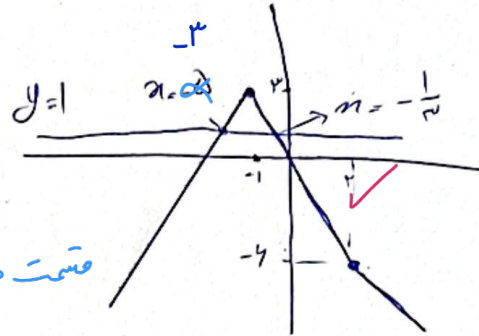
۵



(۲)

۶

~~$\left[\frac{1}{2}, \frac{1}{2} \right]$~~



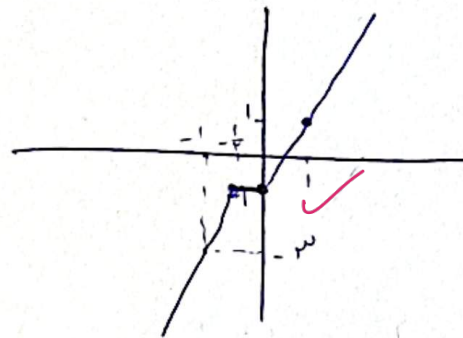
قسمت ها کو چیت از یک دور خواستیم:

صفحه بعد ...

(۱)

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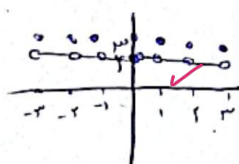
$R_f = \mathbb{R}$ ✓



(۲)

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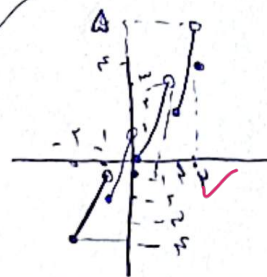
$y = [x] + [-x] + 3$
 $R_y = \{2, 3\}$ ✓



(الف)

$-2 \leq x < -1 \rightarrow 3x+2$
 $-1 \leq x < 0 \rightarrow 3x+1$
 $0 \leq x < 1 \rightarrow 3x$
 $1 \leq x < 2 \rightarrow 3x-1$

$x=2 \rightarrow y=5$



$R_f = [-2, 0)$

(۲)

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$y \begin{cases} \sin = 0 \rightarrow y = 1 \\ \sin = 1 \rightarrow y = 1 \\ \sin = \frac{1}{2} \rightarrow y = \frac{3}{2} \end{cases}$

(الف)

$\sin^2 = 0 \rightarrow y = 1$

$\sin^2 = 1 \rightarrow y = 3$

$\sin^2 = \frac{1}{2} \rightarrow y = \frac{3}{2}$

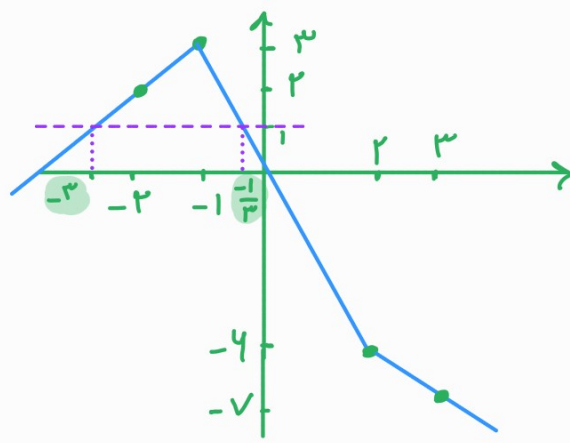
$1 \leq y \leq 3$

(۲)

۱۰

$$\begin{cases} -u-1 & u \geq 1 \\ -1 & -1 \leq u \leq 1 \\ u+1 & u \leq -1 \end{cases}$$

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



-v