

السيد محمد

14, 10

SUBJECT

Year: Month: Day:

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

2 ①

$$yu - y = x^2 + x + 2 \rightarrow x^2 + (1-y)x + 2+y = 0$$

$$\Delta = b^2 - 4ac$$

$$(1-y)^2 - 4(2+y) \geq 0 \quad y^2 + 1 - 2y - 8 - 4y \geq 0$$

$$y^2 - 4y - 7 \geq 0 \quad \Rightarrow y \in (-\infty, -1] \cup [7, +\infty)$$

$$الف) y = 2x^2 - 2x + 1$$

$$-\frac{b}{2a} \Rightarrow \frac{1}{2}$$

3 ②

$$2\left(\frac{1}{2}\right)^2 - 2\left(\frac{1}{2}\right) + 1 = 1 - 1 + 1 = 1$$

$$a > 0 \quad \Rightarrow \quad R_f = \left[-\frac{1}{2}, +\infty\right)$$

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$$ب) y = \sqrt{x^2 + 4x} \geq 0 \Rightarrow \frac{-b}{2a} = \frac{4}{2} = 2$$

$$\sqrt{f(x)} \geq 0 \Rightarrow (0, +\infty) \quad R_f$$

$$ج) y = \sqrt{x^2 + 2x^2 + 2x + 1} \Rightarrow \sqrt{3x^2 + 2x + 1}$$

فوجدت أن دالة R

$$د) y = x^2 - 4x^2 + 2x + 2 \Rightarrow y = -3x^2 + 2x + 2 \Rightarrow R_f = (-\infty, +\infty)$$

4 ③

$$الف) y = \frac{x+1}{x-4} \Rightarrow x = \frac{-4y-1}{y-1}$$

$$R = \left[\frac{1}{4}, 1\right) \cup (1, 2) \cup (2, +\infty)$$

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$$1) y = \sqrt{\frac{\epsilon u + 1}{u - r}} \Rightarrow R - \frac{1}{\epsilon}, R - \sqrt{\epsilon}$$

$$\sqrt{R - \sqrt{\epsilon}} : [0, +\infty) - \sqrt{\epsilon} : R \neq$$

$$2) y = \frac{u^2 + \epsilon}{\sqrt{u^2 + r}} \Rightarrow \frac{u^2 + r + 1}{\sqrt{u^2 + r}} \cdot \frac{1}{\sqrt{u^2 + r}} + \sqrt{u^2 + r}$$

$$3) \frac{1 + \sqrt{r}}{\sqrt{r}} \rightarrow \text{کترین مقدار} \sqrt{r} \quad R_f : \left[\frac{\epsilon}{\sqrt{r}}, +\infty \right)$$

$$4) y = u^2 + \frac{1}{u^2 + \epsilon} \Rightarrow \frac{u^2 + \epsilon + 1}{u^2 + \epsilon} \Rightarrow \frac{\epsilon + 1}{\epsilon} - \frac{1}{\epsilon} \Rightarrow \frac{1}{\epsilon} + \frac{1}{\epsilon} = \frac{2}{\epsilon}$$

$$R_f : \left[\frac{1}{\epsilon}, +\infty \right)$$

$$5) y = \frac{3u^2 + \epsilon}{u^2 - 1} \Rightarrow yu^2 - y = 3u^2 + \epsilon \quad (y - 3)u^2 = \epsilon + y \quad \textcircled{E}$$

$$u = \pm \sqrt{\frac{\epsilon + y}{y - 3}} \quad R_f : R - (-\epsilon, 3] \quad y - r$$

$$6) y = \frac{3u^2 + \epsilon}{u^2 - 1} \quad u^2 = \square \quad \frac{\epsilon + \epsilon}{-1} = -\epsilon \quad \frac{3(+\infty)}{+\infty} = \frac{3}{1} = \text{max}$$

$$7) R_f : R - (-\epsilon, 3] \quad \text{من شد دارد تغیر من شود}$$



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1 $y = \frac{r \sin^2 - 1}{\sin^2 + 3}$ $\rightarrow$ $y \sin^2 + 3y = r \sin^2 - 1$ (5)

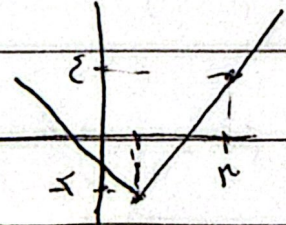
2 $\sin^2 (r - y) = ry + 1$ $\sin^2 = \frac{ry + 1}{r - y}$

3 $\frac{r-1}{\epsilon} = \frac{1}{2}$ $\frac{-r-1}{-r+3} = \frac{1}{2}$

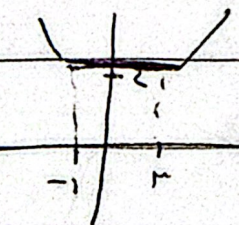
4 $\Rightarrow [-\frac{3}{4}, \frac{1}{2}] = R_f$ طال به بنویس

5 $f(u) = \frac{u^2 - u + 1 + \frac{3}{\epsilon}}{u^2 - u + 1} = 1 - \frac{3}{\epsilon(u^2 - u + 1)}$ (4)

6 $[0, 1)$ طال به بنویس + $D_f = \mathbb{R}$

7 $y = |2u - 2| - |u - 3|$  (4)

8 $x < -2 \rightarrow -x + 2 + u = 3$ $-u - 1$ $\mathbb{R}_f = [-2, +\infty)$

9 $x > 3 \rightarrow x - 2 - u + 3 = u + 1$  $\mathbb{R}_f = [+2, +\infty)$

$$|u-r| - |ru+1| < 1$$

$$ur \rightarrow u-r-ru-1 \rightarrow -u-r$$

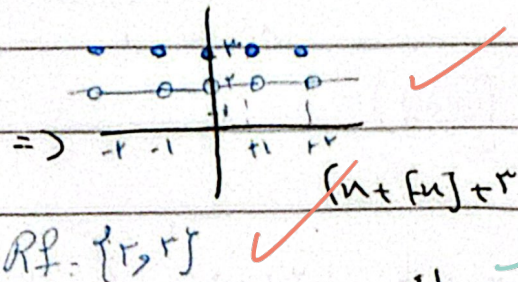
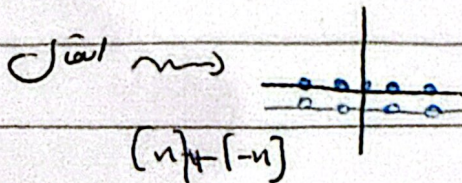
$$x < -\frac{1}{r} - u + r + ru + 1 \Rightarrow u + r$$

$$|u-r| - |ru+1| = 1 \quad \text{Rf. } [-1, +\infty)$$

$$-u+r-ru-1=1$$

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

$$\text{الف) } y = [u] + [-u] + r$$



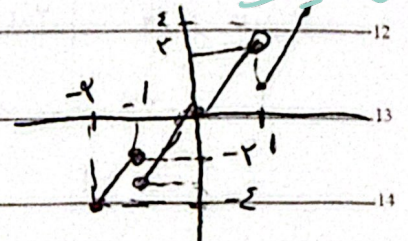
$$\text{Rf. } [r, r]$$

$$\text{ب) } y, ru = [u]$$

$$-1 < x < 1 \Rightarrow y = ru - 1$$

$$1 < x < 2 \Rightarrow y = ru + 1$$

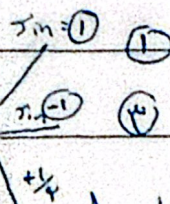
$$-1 < x < -1 \Rightarrow y = ru + r \quad -1 < x < 0 \Rightarrow y = ru + 1$$



$$\text{Rf. } [-r, 0)$$

$$y = \sin^2 u - \sin u + 1$$

$$\sin u = \square$$

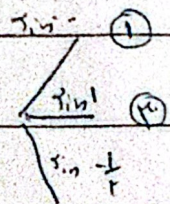


$$\frac{1}{2} - \frac{1}{2} + 1 = \frac{1}{2}$$

$$\text{Rf. } [\frac{1}{2}, 1]$$

$$y = \sin^2 u + \sin u + 1$$

$$\sin u = \square$$



$$(\frac{1}{2})^2 + (\frac{1}{2}) + 1 = \frac{5}{4}$$

$$\text{Rf. } [1, \frac{5}{4}]$$

Genobar

