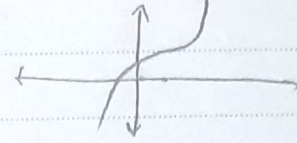


12

الف) $y = x(x^2 - 3x + 3) \rightarrow x^3 - 3x^2 + 3x + 1 - 1$

$(x-1)^3 + 1$ (روش 1) رسم



$R_f = \mathbb{R}$

(روش 2)

$(x-1)^3 = y-1 \Rightarrow x-1 = \sqrt[3]{y-1}$

$x = \sqrt[3]{y-1} + 1$
كل $\mathbb{R}$

ب) $y = \frac{1}{x^2 - x} \rightarrow 4x^2 - 4yx - 1 = 0$

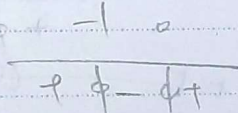
$x = \frac{4y \pm \sqrt{16y^2 + 4y}}{8y}$

لا تعريف
يشود

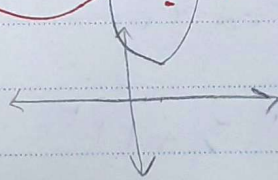
$4y^2 + 4y > 0$

$y(y+1) > 0$

$R_f = \mathbb{R} - \{-1, 0\}$



الف) $y = x^2 - 4x + 10$
 $(x-2)^2 + 6$



$R_f = [6, +\infty)$

12

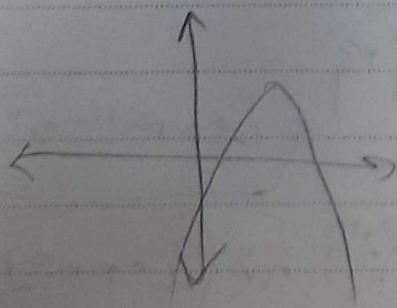
ب) $y = -x^2 + 4x + 3$
 $-(x^2 - 4x - 3)$

$-(x^2 - 4x + 4 - 13)$

$-[(x-2)^2 - 13]$

$-(x-2)^2 + 13$

$R_f = (-\infty, 13]$



ج) $\sqrt{x^2 - 4x - 3}$ $\xrightarrow{\text{اول برد زیر را کامل}} (x-2)^2 - 7 \rightarrow [-7, +\infty)$
 $R_f = [0, +\infty)$ (از دست چیز ص کیریم)

د) $y = \sqrt{-x^2 + 4x}$ $\xrightarrow{\text{بردار زیر را کامل}} (-\infty, \frac{4}{2}] \rightarrow (-\infty, 2]$
 $R_f = [0, 2]$ (جذر)

الف) $y = x^2 - 2x^2 + 2x + 1$ $R_f = \mathbb{R}$

ب) $y = x^4 - 4x^2 + 2x + 2$ $R_f = \mathbb{R}$

ج) $y = \sqrt{x^4 - 4x^2 + 4x + 1}$ $R_f = [0, +\infty)$

د) $y = (x^2 - 4x^2 + 2x + 1)^2$ $R_f = [0, +\infty)$

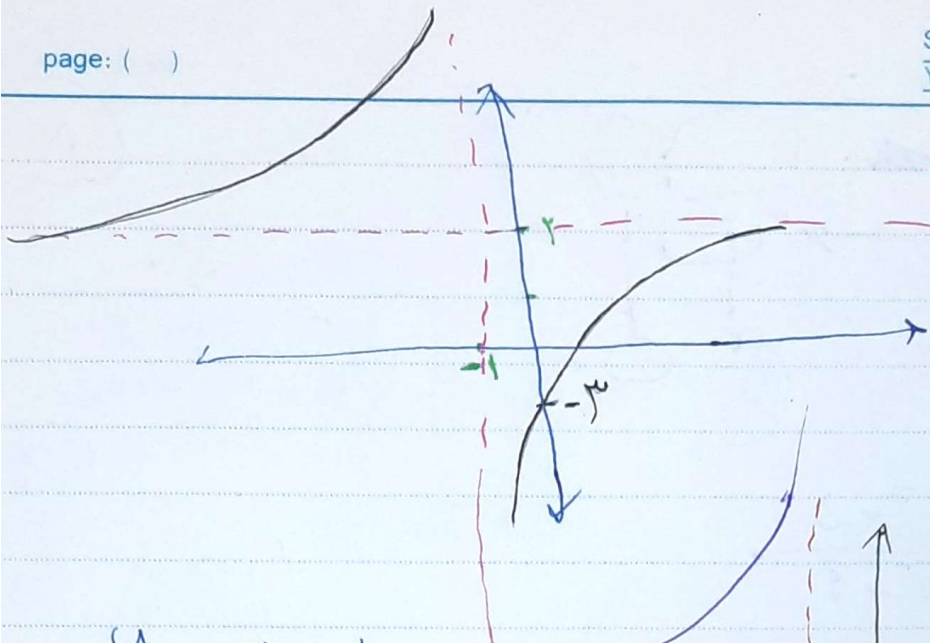
الف) $y = \frac{x+1}{x-2}$ $R_f = \mathbb{R} - \{2\}$

ب) $y = \frac{x+1}{x+1}$ $R_f = \mathbb{R} - \{2\}$

الف) $y = \sqrt{\frac{x+1}{x+1}}$ $\rightarrow \mathbb{R} - \{2\}$ $[0, +\infty) - \sqrt{2}$

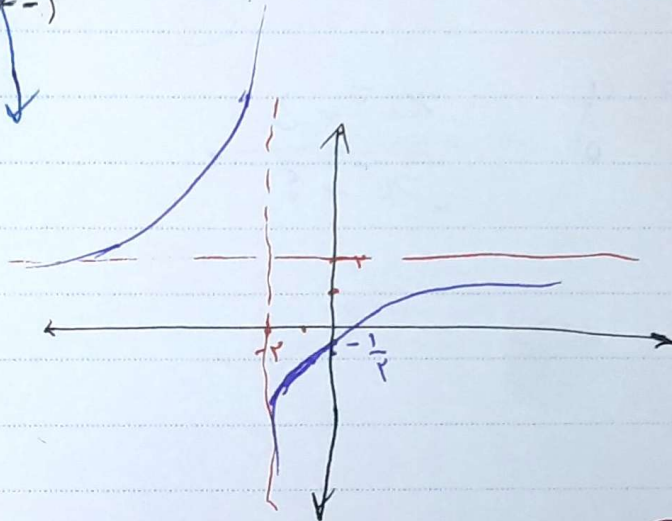
ب) $y = \sqrt{\frac{x+1}{-x+2}}$ $\rightarrow \mathbb{R} - \{2\}$ $[0, +\infty)$

9



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

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



الف: $y = \sin x + \frac{1}{\sin x}$ $\sin x \Rightarrow (-\infty, -1] \cup [1, +\infty)$

IR $R_f = (-1, 1)$

ب: $y = x^2 + \frac{1}{x^2}$ $\Rightarrow (-\infty, -1] \cup [1, +\infty) \Rightarrow R_f = \mathbb{R} - (-1, 1)$

ج: $y = \sqrt{x} + \frac{1}{\sqrt{x}}$ $\Rightarrow (-\infty, -1] \cup [1, +\infty) \Rightarrow R_f = \mathbb{R} - (-1, 1)$

د: $y = \sqrt{x} + \frac{1}{\sqrt{x}}$ $\Rightarrow (+) \Rightarrow R_f = [1, +\infty)$

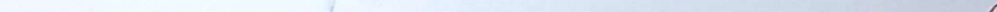
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⑤

$$\mu + \frac{1}{\mu} = \frac{10}{\mu} \Rightarrow R_f = \left[\frac{1}{\mu}, +\infty \right)$$

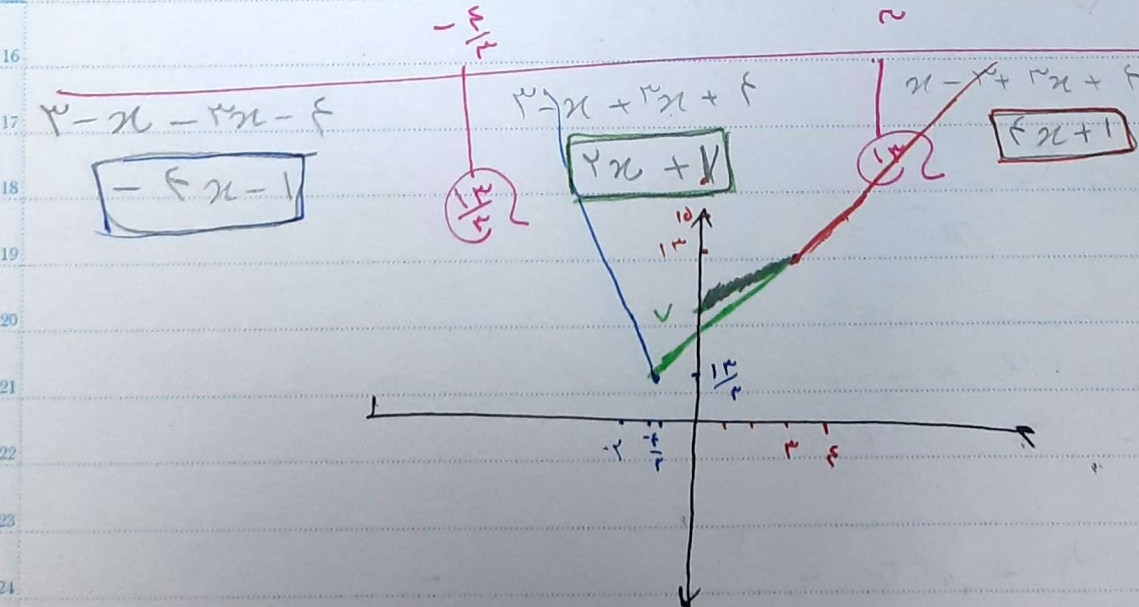
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$$Min = \boxed{r_1} \cdot \frac{1}{2}$$

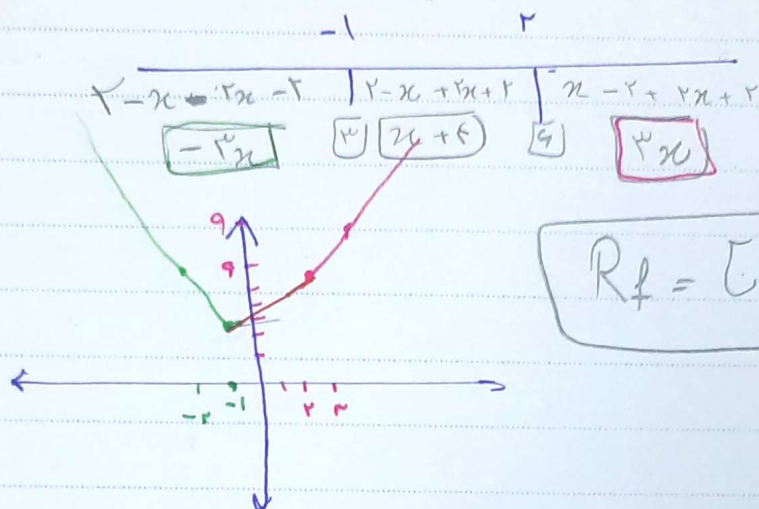
13 

14 $y = |x - r| + |rx + f|$ (9)

15



الف) $y = |x-2| + 2|x+1|$



ب) $y = 2|x-1| - |x+1|$

