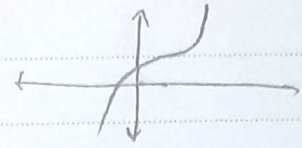


12

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

$(x-1)^3 + 1$  (روش رسم)



$R_f = \mathbb{R}$

(روش دوم)

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

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

$\mathbb{R}$

1, 75

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

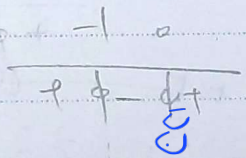
$x = \frac{4y \pm \sqrt{16y^2 + 4y}}{8y}$

با تعریف  
بشود

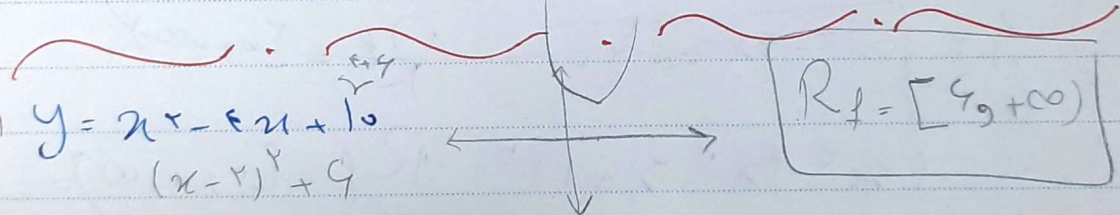
$4y^2 + 4y \geq 0$

$y(y+1) \geq 0$

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



$y \neq 0$



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

$R_f = [6, +\infty)$

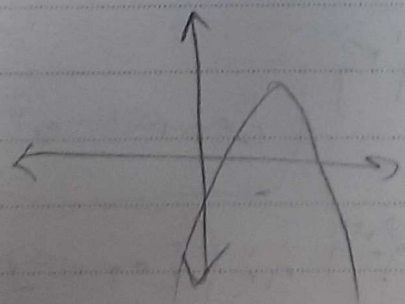
12

ب)  $y = -x^2 + 4x + 3 \rightarrow -(x^2 - 4x + 9 - 14)$   
 $-(x^2 - 4x - 5)$

$-(x+3)^2 - 14$

$-(x-3)^2 + 11$

$R_f = (-\infty, 11]$



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

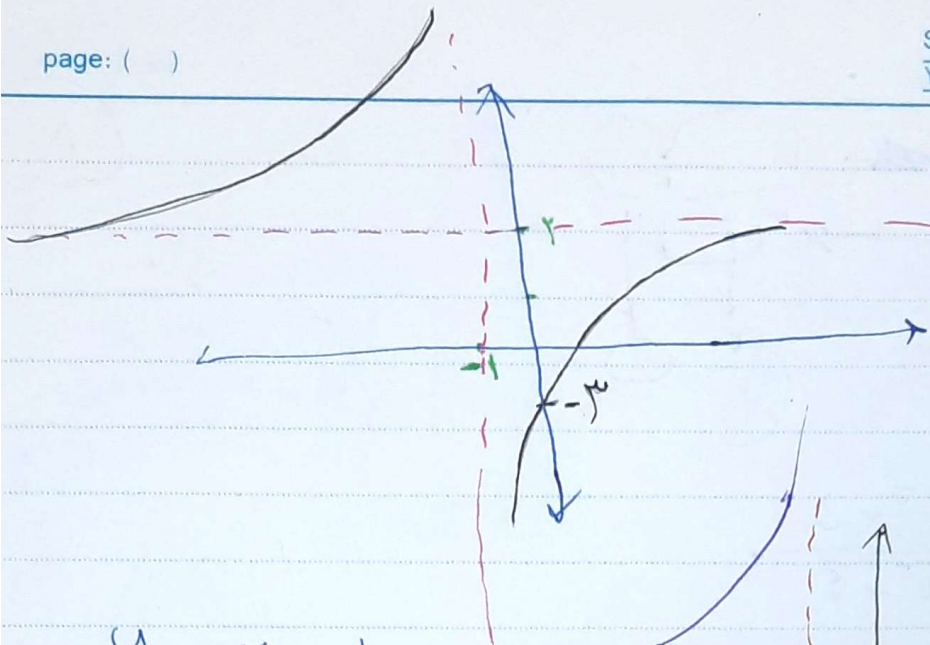
د)  $y = (x^2 - 4x^2 + 2x + 1)^2$   $R_f = [0, +\infty)$

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

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

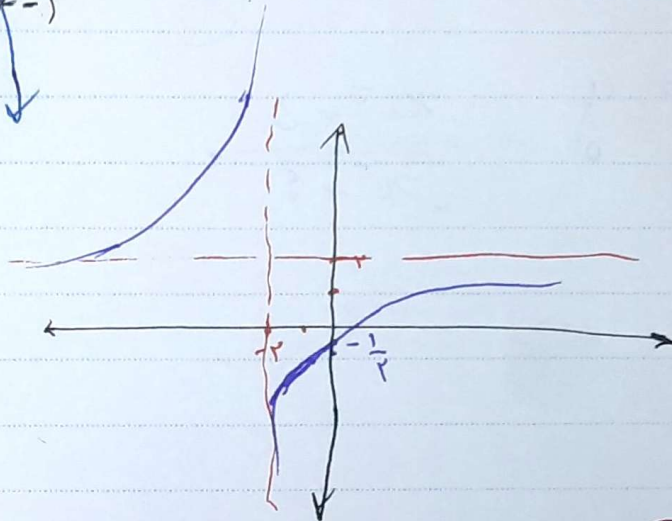
الف)  $y = \sqrt{\frac{x+1}{x+1}}$   $\rightarrow \mathbb{R} - \{2\}$   $[0, +\infty) - \sqrt{2}$

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



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

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



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

IR  $R_f = (-1, 1)$

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

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

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

⑤

5

$$R_f = \left[ \frac{1}{x}, +\infty \right)$$

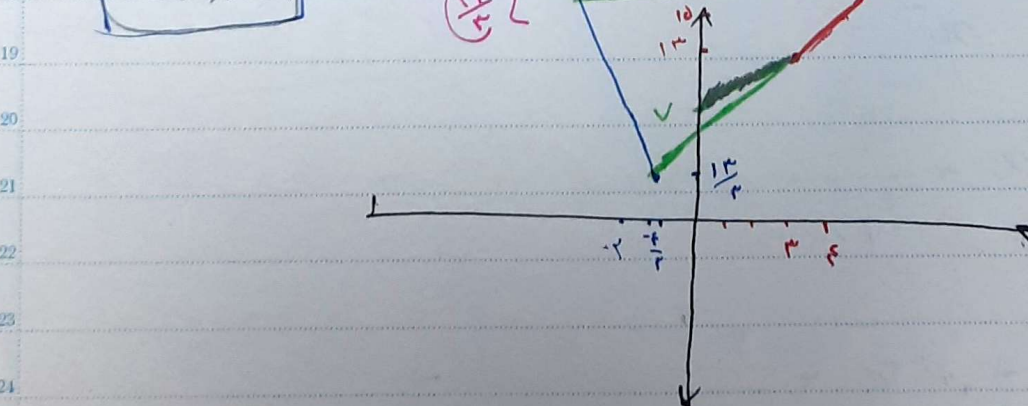
$$\sqrt{25 + 9}$$

گفتا بلت صفر سن هزار

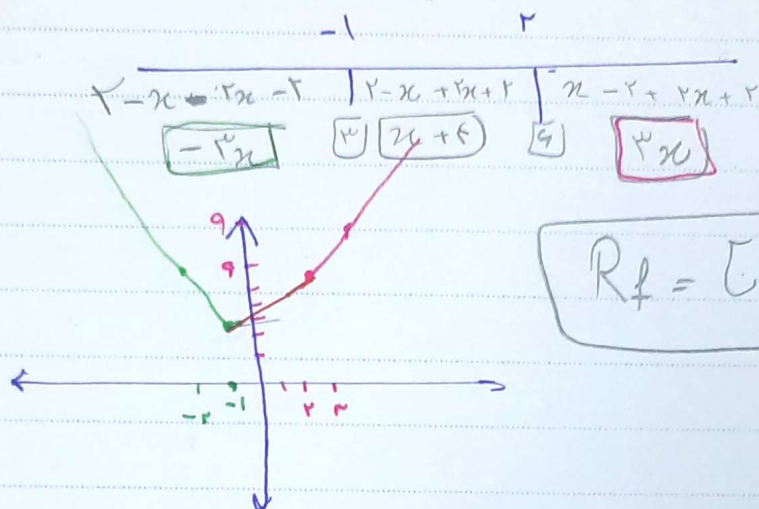
$$R_f = (r, d, +\infty)$$

9

$$\leftarrow x+1$$

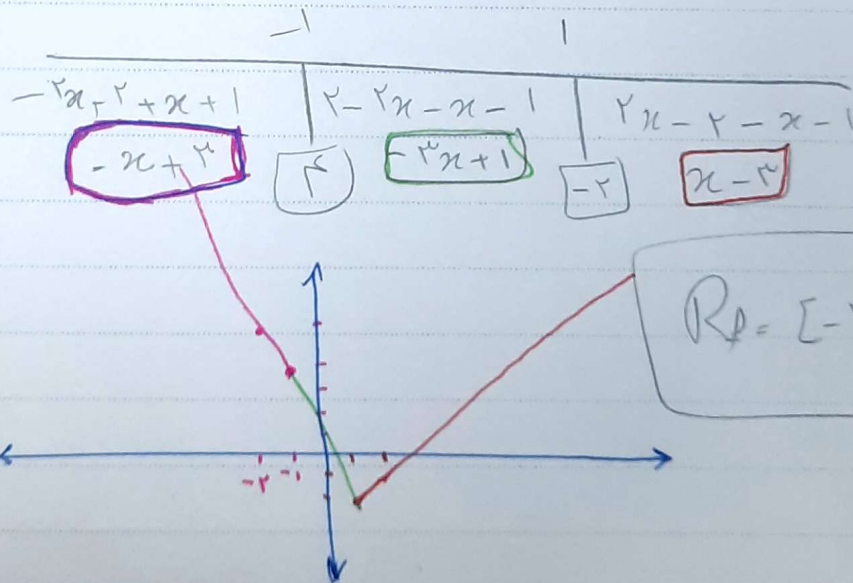


الف)  $y = |x-2| + 2|x+1|$



$R_f = [3, +\infty)$

ب)  $y = 2|x-1| - |x+1|$



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