

الف) $y = x^2 - 5$ $x^2 = y + 5$ $y + 5 \geq 0$ $R_f = [-5, +\infty)$ $y \geq -5$ $x = \pm \sqrt{y+5}$ (۲)

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

الف) $y = x^2 - 2x + 4$ $y = x^2 - 2x + 1 + 3$ $R_f = [3, +\infty)$ $y - 3 = (x - 1)^2 \Rightarrow x = \pm \sqrt{y-3} + 1$ $y - 3 \geq 0$ $y \geq 3$ (۲)

ب) $y = x^2 - 4x + 1$ $x^2 - 4x + \frac{16}{4} - \frac{11}{4} = y$ $R_f = [-\frac{11}{4}, +\infty)$ $(x - \frac{4}{1})^2 = y + \frac{11}{4} \Rightarrow x = \pm \sqrt{y + \frac{11}{4}} + \frac{4}{1}$ $y \geq -\frac{11}{4}$

الف) $y = \frac{x^2 + 3}{x^2 - 2}$ $x^2 y - 2y = x^2 + 3$ $x^2 = \frac{3 + 2y}{y - 1}$ $\frac{1}{+\frac{1}{2}} - \frac{-\frac{3}{2}}{+}$ $x = \pm \sqrt{\frac{3+2y}{y-1} - \frac{3}{2}}$ $(-\infty, \frac{3}{2}] \cup (1, +\infty)$ $R_f =$ (۲)

ب) $y = \frac{2|x| + 1}{|x| - 4}$ $|x|y - 4y = 2|x| + 1$ $|x|(y - 4) = 4y + 1$ $|x| = \frac{4y + 1}{y - 4}$ $\frac{1}{+\frac{1}{4}} - \frac{-\frac{1}{4}}{+}$ $R_f = (-\infty, -\frac{1}{4}] \cup (4, +\infty)$

$y = \frac{1}{x^2 - 2x}$ $y x^2 - 2x y = 1$ $4y \pm \sqrt{16y^2 + 4y} = 16y^2 + 4y \geq 0$ $y \neq 0 \leftarrow 2y$ $\frac{0}{+\frac{1}{4}} - \frac{-\frac{1}{4}}{+}$ $\frac{1}{x^2 - 2x} \neq 0$ $R_f = [0, +\infty) \cup (-\infty, -\frac{1}{4}] \rightarrow (-\infty, -\frac{1}{4}] \cup (0, +\infty)$ (۲)

صفر در بدنه قرار ندارد

الف) $y = x^2 - 4x + 2$ $\frac{-b}{2a} = \frac{4}{2} = 2$ $R_f = [-2, +\infty)$ $4 - 16 + 2 = -8$ (۲)

ب) $-x^2 + 4x + 2 = y$ $\frac{-b}{2a} = \frac{-4}{-2} = 2$ $R_f = (-\infty, 4]$ $-4 + 16 + 2 = 14$

الف) $y = \sqrt{x^2 - 4x + 4}$
min

$\left| \frac{-b}{2a} = \frac{4}{2} = 2 \right|$

$\sqrt{[-4, +\infty)} = R_f = [0, +\infty)$

(4)

ب) $y = \sqrt{-x^2 + 4x + 10}$
max

$\left| \frac{-b}{2a} = \frac{-4}{-2} = 2 \right|$
 $-4 + 10 + 10 = 16$

$\sqrt{(-\infty, 14]} = R_f = [0, \sqrt{14}]$

(2)

الف) $y = x^2 + 4x + 4$

$R_f = \mathbb{R}$

(4)

ب) $y = \sqrt{x^4 + 4x^2 + 4}$

$R_f = [0, +\infty)$

(2)

الف) $y = \frac{4x+1}{x-2}$

$R_f = \mathbb{R} - \{2\}$

(1)

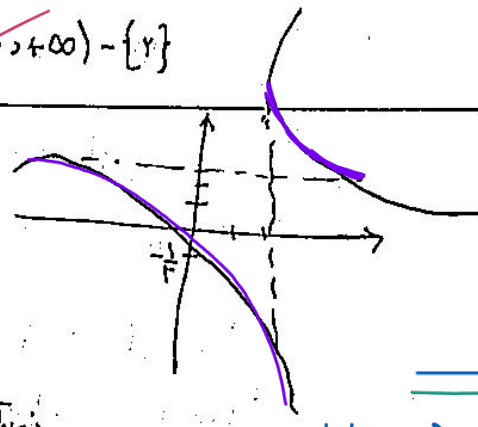
ب) $y = \sqrt{\frac{4x+1}{x+3}}$

$\sqrt{\mathbb{R} - \{2\}} = R_f = [0, +\infty) - \{2\}$

(2)

الف) $y = \frac{4x+1}{x-2}$

بجانب افقی: 2
بجانب قائم: 4



(1, 2)

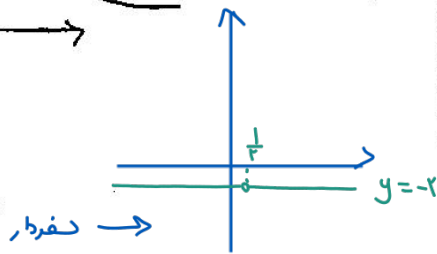
(9)

$y = \frac{4(2x-1)}{-2x+1} = -2 \rightarrow Dy = \mathbb{R} - \{1/2\}$

ب) $y = \frac{4x-2}{-2x+1}$

$ad \neq bc$
 $4x-2 = -2x-2$

نمی توان مثلث کرد
چرا؟



الف) $y = \cos^2 x + \frac{1}{\cos^2 x}$

$R_f = [2, +\infty)$

(1, 2)

(10)

ب) $y = \sqrt[3]{\frac{x^2+1}{x}} = \sqrt[3]{x + \frac{1}{x}}$

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

★ اذنیال فرجه 3 باید روی بردار فعال شود

$R_f = (-\infty, \sqrt[3]{-2}] \cup [\sqrt[3]{2}, +\infty)$