

الف) $y = x^2 - 5$ $x^2 = y + 5$ $x = \sqrt{y+5}$ ①

$R_f = [-5, +\infty)$

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

$R_f = \mathbb{R}$

الف) $y = x^2 - 4x + 7$ $y = (x-2)^2 + 3$ ②

$R_f = [3, +\infty)$ $(x-2)^2 = y-3 \rightarrow x-2 = \sqrt{y-3}$ $x = \sqrt{y-3} + 2$

ب) $y = x^2 - 5x + 1$ $y = x^2 - 5x + 1 + 5, 25 - 5, 25 = (x-2, 5)^2 - 5, 25$

$R_f = [-5, 25, +\infty)$ $\sqrt{y+5, 25} = x-2, 5$
 $\sqrt{y+5, 25} + 2, 5 = x$

الف) $y = \frac{x^2+3}{x^2-2}$ $y(x^2-2) = x^2+3$ ③

$x^2(y-1) = 3+2y$ $x^2 = \frac{3+2y}{y-1} \rightarrow x = \sqrt{\frac{3+2y}{y-1}}$

$R_f = (-\infty, -\frac{3}{2}] \cup (1, +\infty)$

ب) $y = \frac{2|x|+1}{|x|-2}$ $y|x|-2y = 2|x|+1$ $|x|(y-2) = 2y+1$ $|x| = \frac{2y+1}{y-2}$ ④

$R_f = (-\infty, -\frac{1}{2}] \cup (2, +\infty)$

$y = \frac{1}{x^2-4x}$ $yx^2-4xy = 1$ ⑤

$yx^2-4xy-1 = 0$

$\Delta = -(-4y) \pm \sqrt{(-4y)^2 - (4 \times y \times -1)}$ $\Delta \geq 0$ $14y^2 + 4y \geq 0$

$4y(4y+1) \geq 0$

$-\frac{1}{4} \quad 0$
 $+$ $-$ $+$

Negar NOTE $R_f = (-\infty, -\frac{1}{4}] \cup [0, +\infty)$

الف) $y = x^2 - 4x + 2$ $x = \frac{-b}{2a} = \frac{4}{2} = 2$ $y = 9 - 11 + 2 = -1$ - (5)

$R_f = [-1, +\infty)$ (min)

ب) $y = -x^2 + 4x + 2$ $x = \frac{-b}{2a} = \frac{-4}{-2} = 2$ $y = -4 + 11 + 2 = 9$

$R_f = (-\infty, 9]$ (max)

الف) $y = \sqrt{x^2 - 4x + 2}$ $x = \frac{-b}{2a} = \frac{4}{2} = 2$ $y = 0$ - (6)

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

ب) $y = \sqrt{-2x^2 + 4x + 10}$ $x = \frac{-b}{2a} = 2$ $y = 12$ $R_f = \sqrt{(-\infty, 12]} \rightarrow R_f = [0, 12]$

الف) $y = x^4 + 12x^2 + 1$ $R_f = \mathbb{R}$ - (7)

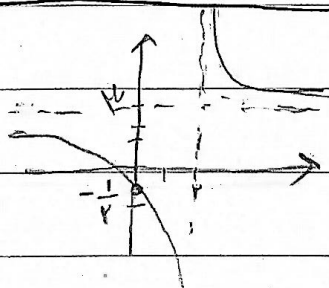
ب) $y = \sqrt{x^4 + 12x^2 + 1}$ $R_f = [0, +\infty)$

الف) $y = \frac{3x+1}{x-2}$ $R_f = \mathbb{R} - \left\{\frac{a}{c}\right\} = \mathbb{R} - \{3\}$ - (8)

ب) $y = \sqrt{\frac{3x+1}{x+2}}$ $R_f = [0, +\infty) - \{3\}$

الف) $y = \frac{3x+1}{x-2}$

مجاوب قائم: $\frac{a}{c} = 3$
مجاوب افق: $\frac{a}{c} = 3$



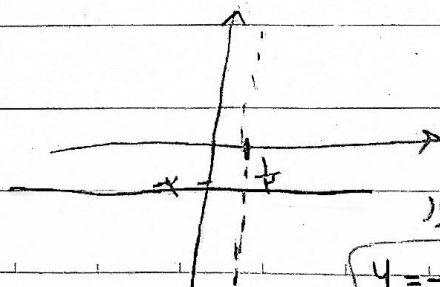
$x=0$
 $y = -\frac{1}{2}$

ب) $y = \frac{3x-2}{1-2x}$

مجاوب قائم: $\frac{1}{2}$

مجاوب افق: $\frac{3}{-2} = -1.5$

$x=0, y = -2$



برای اینکه حالت خاص

موردنامه چون به از

ساده کردن به یک

مقدار ثابت تبدیل می شود

$y = -2$ Mega NOTE

الف) $y = \cos^2 x + \frac{1}{\cos^2 x}$ $R_f = [x_0 + \infty)$ - ⑩

ب) $y = \sqrt[n]{\frac{x^2 + 1}{x}} = \sqrt[n]{x + \frac{1}{x}}$ $R_f = (-\infty, -1] \cup [x_0 + \infty)$