

المستطابق

المطابق

الف) $y = x^2 - a$ $-x^2 = -y - a$ $x^2 = y + a$ $x = \sqrt{y + a}$ $y + a \geq 0$ $y \geq -a$ $R_f = [-a, +\infty)$:1

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

الف) $y = x^2 - 4x + 4$ $y = (x - 2)^2 + 2$ $(x - 2)^2 = y - 2$ $x - 2 = \pm \sqrt{y - 2} + 2$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $y - 2 \geq 0$ $y \geq 2$ $R_f = [2, +\infty)$

ب) $y = x^2 - 2x + 1$ $\frac{x^2 - 2x + 1}{x^2 - 2x} = 0$ $1 - 2(1 - y) \geq 0$ $2y - 1 \geq 0$ $y \geq \frac{1}{2}$ $R_f = [\frac{1}{2}, +\infty)$

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

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

الف) $y = \frac{1}{x^2 - 4x}$ $yx^2 - 4y = 1$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $14y^2 + 4y \geq 0$ $4y(4y + 1) \geq 0$ $R_f = (-\infty, -\frac{1}{4}] \cup [0, +\infty)$

ب) $y = \frac{2x^2 + 4x + 2}{x^2 - 4x + 4}$ $a < 0$ $x_{min} = \frac{-b}{2a} = \frac{-4}{-2} = 2$ $y_{min} = -1$ $R_f = [-1, +\infty)$

الف) $y = \sqrt{x^2 - 4x + 4} = |x - 2|$ $a > 0$ $x_{min} = \frac{-b}{2a} = \frac{-4}{2} = -2$ $y_{min} = -1$ $R_f = [-1, +\infty)$

$$ب) y = \sqrt{-x^2 + 5x + 1}$$

$-x^2 + 5x + 1$

$a < 0$

$$x_{max} = \frac{-b}{2a} \quad \frac{-5}{-2} = +2.5$$

$$y_{max} = 1.5$$

$$\sqrt{-\infty, 1.5} = [0, 5]$$

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$$الذ) y = x^2 + 4x^2 + 2x + 1 \quad R_f = R$$

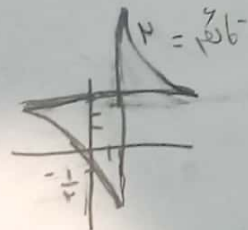
$$ب) \sqrt{x^2 + 4x^2 + 2x + 1} \quad R_f = [0, +\infty)$$

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$$الذ) y = \frac{x+1}{x-2} \quad R_f = \mathbb{R} - \left\{ \frac{1}{2} \right\}$$

$$ب) \sqrt{\frac{x+1}{x+2}} \quad R_f = [0, +\infty] - \left\{ \frac{1}{2} \right\}$$

$$الذ) y = \frac{x+1}{x-2} \quad w = \frac{a}{c} \text{ (افقى)}$$



$$ب) y = \frac{x-2}{1-2x} \quad \frac{-2(1-2x)}{1-2x} = -2$$

$$y = -2$$

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