

الف) $y = x^2 - 4 \rightarrow [-4, +\infty)$ ✓

ب) $y = x^2 - 1$
 $x^2 \in \mathbb{R} \rightarrow (-\infty, +\infty)$ ✓

الف) $y = x^2 - 4x + 4 \rightarrow [0, +\infty)$ $R_f = [0, +\infty)$
 $y = (x-2)^2 + 2 \rightarrow x = \pm \sqrt{y-2} + 2$

ب) $y = x^2 - 4x + 1 \rightarrow x = \frac{4 \pm \sqrt{16-4(y-1)}}{2} = 2 \pm \sqrt{y-3}$
 $R_f = [-3, +\infty)$

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

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

الف) $y = x^2 - 6x + 2 \rightarrow R_f = [-3, +\infty)$
 $a) \rightarrow \begin{cases} x_{min} = \frac{b}{2a} = 3 \\ y_{min} = -9 \end{cases} R_f = [-9, +\infty)$
 $y = -x^2 + 6x + 2 \rightarrow (-\infty, 6]$ ✓

الف) $y = \sqrt{x} - 4x + 1 \rightarrow (-\infty, 0] \cup [4, +\infty)$

ب) $y = \sqrt{-x^2 + 4x + 1}$
 $R_f = [-1, 1]$
 $a) \rightarrow \begin{cases} x_{min} = -\frac{b}{2a} = 2 \\ y_{min} = -1 \end{cases} R_f = [-1, 1]$
 $R_f = \sqrt{(-\infty, 1]} = [0, \sqrt{1}]$

$$y = x^V + w_x^T e + r_x + 1$$

$$\rightarrow \mathbb{R}$$

①

$$x^A = \{x^T + s_x + 1\}$$

$$\rightarrow \mathbb{R}$$

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

$$(الف) \frac{w_x + 1}{x - r}$$

$$\rightarrow \mathbb{R} - \{r\}$$

①

$$R_f = \mathbb{R} - \{r\} \xrightarrow{\text{دليل}} R_f = (-\infty, +\infty) - \{r\}$$

