

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

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

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

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

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

الف) $y = x^2 - 4x + 2$ $a > 0 \rightarrow \begin{cases} x_{min} = \frac{b}{2a} = \frac{4}{2} = 2 \\ y_{min} = -V \end{cases}$ $R_f = [-V, +\infty)$

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

الف) $y = \sqrt{x^2 - 4x + 3}$ $a > 0 \rightarrow \begin{cases} x_{min} = \frac{4}{2} = 2 \\ y_{min} = -V \end{cases}$ $\sqrt{[-V, +\infty)} \rightarrow [0, +\infty)$

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

$$y = \frac{1}{x^2 - 2x} \cdot yx^2 - 2yx = 1.50$$

$$(-2y)^2 = 2xyx + 1.5y^2 + 2y \cdot 0$$

$$2y(y+1) = 0$$

$$y = \frac{2y+1}{2}$$

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

$$R_f = (-\infty, -\frac{1}{2}] \cup (0, +\infty)$$

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

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

الف) $y = \frac{x+1}{x-2}$

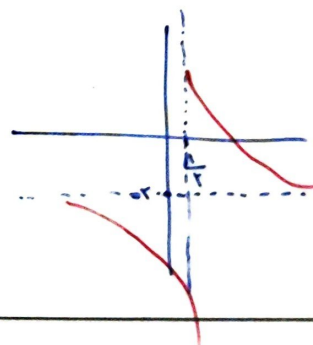
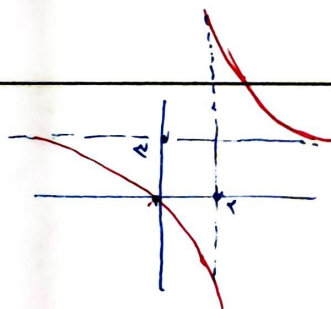
$$R_f = \mathbb{R} - \{2\}$$

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

$\sqrt{\frac{x}{x}} = 1$

الف) $y = \frac{x+1}{x-2}$ 3 بجانب قائم
2 بجانب أفقي

ب) $y = \frac{x-2}{1-2x}$ 1/2 بجانب قائم
-2 بجانب أفقي



الف) $y = \cos^2 x + \frac{1}{\cos^2 x} \Rightarrow R_f = [2, +\infty)$

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

R_f