(عاطفه سیفی) ـ دهم دفتر B

1) الف) $y = x^2 - 5 \rightarrow x^2 = y + 5 \rightarrow x = \pm\sqrt{y+5} \rightarrow R_f = [-5, +\infty)$

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

2) الف) $y = x^2 - 4x + 6 \rightarrow y = (x-2)^2 + 2 \rightarrow x = \pm\sqrt{y-2} + 2$
$\rightarrow R_f = [2, +\infty)$

ب) $y = x^2 - 5x + 1$

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

$\left.\begin{matrix} y - 1 > 0 \\ 2y + 3 \geq 0 \end{matrix}\right\} \rightarrow R_f = (1, +\infty)$

ب) $y = \dfrac{2|x|+1}{|x|-4} \rightarrow y|x| - 4y = 2|x| \rightarrow |x| = \dfrac{4y+1}{y-2}$

4) $y = \dfrac{1}{x^2 - 4x}$

5) الف) $y = x^2 - 6x + 2$ $\begin{cases} x_{min} = \dfrac{-b}{2a} = 3 \\ y_{min} = -7 \end{cases}$ $R_f = [-7, +\infty)$
$a > 0 \rightarrow x_{min}$

ب) $y = -x^2 + 4x + 2$ $\begin{cases} x_{max} = \dfrac{-b}{2a} = 2 \\ y_{max} = 6 \end{cases}$ $R_f = (-\infty, 6]$
$a < 0 \rightarrow x_{max}$

6) الف) $y = \sqrt{x^2 - 6x + 2}$ $\begin{cases} x_{min} = 3 \\ y_{min} = -7 \end{cases}$ $R_f = \sqrt{[-7, +\infty)} = R_f = [0, +\infty)$

ب) $y = \sqrt{-x^2 + 4x + 10}$ $\begin{cases} x_{max} = 2 \\ y_{max} = 14 \end{cases}$ $R_f = \sqrt{(-\infty, 14]} = R_f = [0, \sqrt{14}]$

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الف) $y = x^{\frac{1}{2}} + x^{\frac{1}{3}} + 2x + 1 \longrightarrow R_f = \mathbb{R}$

ب) $y = \sqrt{x^{\frac{3}{2}} + 4x^2 + 4x + 1} \longrightarrow R_f = [0, +\infty)$

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الف) $y = \frac{x^3 + 1}{x - 2} \longrightarrow R_f = \mathbb{R} - \{3\}$

ب) $y = \sqrt{\frac{4x+1}{x+3}} \longrightarrow R_f = [0, +\infty) - \{4\}$

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

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