

الف) $m^2 = y + a \rightarrow m = \pm \sqrt{y+a} \rightarrow y+a \geq 0 \rightarrow y \geq -a \xrightarrow{R_f} [-a, +\infty)$

ب) $m^2 = y - 1 \rightarrow m = \sqrt{y-1} \rightarrow R_f = \mathbb{R}$

الف) $y = (m-2)^2 + 2 \rightarrow (m-2)^2 = y-2 \rightarrow m-2 = \pm \sqrt{y-2} \rightarrow m = \pm \sqrt{y-2} + 2 \quad y-2 \geq 0 \rightarrow y \geq 2 \xrightarrow{R_f} [2, +\infty)$

ب) $m^2 - 5m + 1 = y = 0 \rightarrow m = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{5 \pm \sqrt{25-4}}{2} = \frac{5 \pm \sqrt{21}}{2} \xrightarrow{-\frac{1}{f}} \frac{1}{y} \geq 0 \rightarrow y \geq 0 \rightarrow R_f = [0, +\infty)$

الف) $y m^2 - y = m^2 + 2 \rightarrow y m^2 - m^2 = 2 + y \rightarrow m^2(y-1) = 2+y$

$m^2 = \frac{2+y}{y-1} \rightarrow m = \pm \sqrt{\frac{2+y}{y-1}} \rightarrow \frac{-\frac{1}{f}}{+\frac{1}{f}-\frac{1}{y}} \rightarrow R_f = (-\infty, -\frac{1}{f}] \cup (1, +\infty)$

ب) $y|m| - 4y = 2|m| + 1 \rightarrow y|m| - 2|m| = 4y + 1 \rightarrow |m|(y-2) = 4y + 1 \rightarrow |m| = \frac{4y+1}{y-2} \geq 0$

$R_f = (-\infty, -\frac{1}{4}] \cup (2, +\infty)$ الف) $y m^2 - 4y m + 1 = 0 \rightarrow y m^2 - 4y m + 1 = 0 \rightarrow m = \frac{-b \pm \sqrt{\Delta}}{2a}$

$m = \frac{4y \pm \sqrt{16y^2 - 4y}}{2y} \rightarrow 16y^2 - 4y \geq 0 \rightarrow -4y(4y-1) \geq 0 \rightarrow \frac{-\frac{1}{f}}{+1-\frac{1}{y}} \rightarrow y \neq 0 \rightarrow y \neq 0$

الف) $\min \rightarrow \text{طول} = \frac{-b}{2a} \rightarrow \frac{1}{y} = 3 \rightarrow y = -\frac{1}{3} \rightarrow R_f = [-\frac{1}{3}, +\infty)$

ب) $\max \rightarrow \frac{-r}{-r} = 2 \rightarrow \text{عرض} = 4 \rightarrow R_f = (-\infty, 4]$

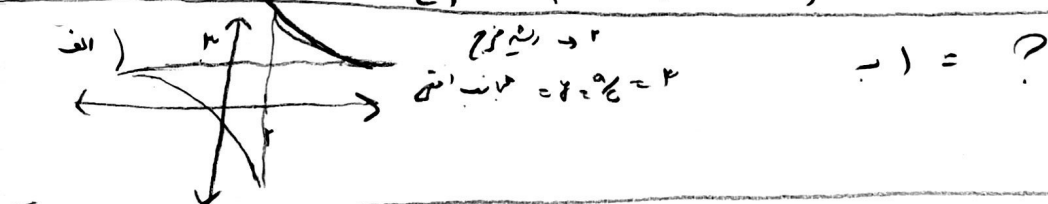
الف) $\min \rightarrow \frac{-b}{2a} = \frac{1}{y} = 3 \rightarrow \text{عرض} = -\frac{1}{3} \rightarrow R_f = [-\frac{1}{3}, +\infty) \rightarrow \sqrt{\quad} \rightarrow [0, +\infty)$

ب) $\max \rightarrow \text{طول} = \frac{-r}{-r} = 2 \rightarrow \text{عرض} = 4 \rightarrow R_f = (-\infty, 4] \rightarrow \sqrt{\quad} \rightarrow [0, 4]$

الف) $\text{میزان تغییرات} \rightarrow R_f = \mathbb{R}$ ب) $\text{میزان تغییرات} \rightarrow R_f = \mathbb{R} \rightarrow \text{میزان تغییرات} \rightarrow R_f = [0, +\infty)$

الف) $\text{میزان تغییرات} = \mathbb{R} - \left\{ \frac{a}{c} \right\} \rightarrow \frac{1}{f} = 3 \rightarrow R_f = \mathbb{R} - \{3\}$

ب) $\text{میزان تغییرات} = \mathbb{R} - \left\{ \frac{a}{c} \right\} \rightarrow \frac{1}{f} = 2 \rightarrow \mathbb{R} - \{2\} \rightarrow \sqrt{\quad} \rightarrow [0, +\infty) - \{2\}$



الف) $\rightarrow a + \frac{1}{a} \geq R_f = [2, +\infty)$ ب) $\sqrt[3]{m+1} \rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$