

الف) $x^2 = y + 5$ $x = \pm \sqrt{y + 5}$ $y + 5 \geq 0$ $y \geq -5$ $R_f = [-5, +\infty)$

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

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

ب) $y = x^2 - 5$ $x + 1 + \frac{y}{x} - \frac{y}{x} = y = (x - \frac{5}{x})^2 - \frac{y}{x}$ $(x - \frac{5}{x})^2 = y + \frac{y}{x}$

$x = \pm \sqrt{y + \frac{y}{x}} + \frac{5}{x} \Rightarrow y \geq -\frac{y}{x}$ $R_f = [-\frac{y}{x}, +\infty)$

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

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

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$yx^2 - 4yx = 1$ $yx^2 - 4yx - 1 = 0$ $14y^2 + 4y + y(4y + 1)$

$x = \frac{4y \pm \sqrt{(-4y)^2 - (-4y)}}{2y} = \frac{4y \pm \sqrt{16y^2 + 4y}}{2y}$ $\frac{-\frac{1}{4y} - \frac{0}{4y}}{\frac{-1}{4y} - \frac{0}{4y}}$

$2y \Rightarrow y \neq 0$

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

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الف) $\frac{b}{ra} = 3$ $9 - 18 + 2 = -7$ $\min \left| \frac{r}{-7} \right|$ $R_f = [-7, +\infty)$

ب) $\frac{b}{ra} = \frac{-r}{-r} = 2$ $-r + 18 + 2 = 4$ $\max \left| \frac{r}{4} \right|$ $R_f = (-\infty, 4]$

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جواب 1) $\min \left| \frac{r}{-v} \right| \quad R = \sqrt{[-v, +\infty)} \Rightarrow R_f = [0, +\infty)$

جواب 2) $\frac{b}{ra} = \frac{-t}{-r} = r \quad -t + \infty + 1 = 1t \quad R = \sqrt{(-\infty, 1t]} \Rightarrow R_f = [0, \sqrt{1t}]$

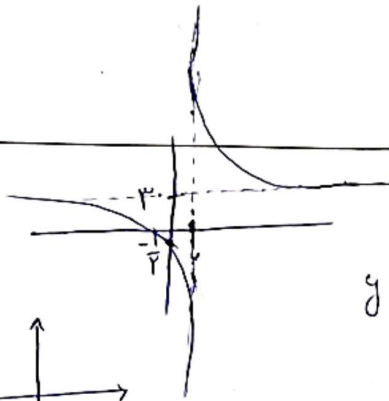
جواب 1) $R_f = \mathbb{R}$

جواب 2) $R = \sqrt{\mathbb{R}} \Rightarrow R_f = [0, +\infty)$

جواب 1) $\frac{a}{c} = r \quad R = \mathbb{R} - \{r\}$

جواب 2) $\frac{a}{c} = r \quad R = \sqrt{\mathbb{R} - \{r\}} = [0, +\infty) - \{r\}$

جانب اعظم $\rightarrow \frac{r}{m-1} = r$
جانب اقل $\rightarrow \frac{a}{c} = r$



$x \rightarrow 0 \rightarrow y = \frac{r+1}{n-r} = \frac{-1}{r}$

جواب 2) $y = \frac{r-1}{-(r-1)} \Rightarrow y = -r$

جواب 1) $\cos^n > 0 \quad R_f = [r, +\infty)$

جواب 2) $y = \sqrt[n]{n + \frac{1}{n}} \quad R_f = (-\infty, -r] \cup [r, +\infty)$