

$$|x| \leq \frac{-2y-1}{y-1}$$

$$\frac{-1}{+1} \leq \frac{1}{-1} \leq +$$

$$R_f = R - (-\frac{1}{r}, 1]$$

(الف)

$$\left. \begin{array}{l} n > 0 \rightarrow n + \frac{1}{n} \\ n < 0 \rightarrow -n - \frac{1}{n} \end{array} \right\} \rightarrow R_f = (-\infty, -1] \cup [1, +\infty)$$

(ب)

$$y^2 x + 3y = x^2 + 2x - 2 \rightarrow x^2 + x(1-y) - 2 - 3y = 0$$

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

$$\frac{-1}{+1} \leq \frac{1}{-1} \leq + \rightarrow R_f = R - (-1, -2)$$

$$x^2 - m + 1 \neq 0 \rightarrow R_f = R \mid y^2 x^2 - mx + y = x^2 - m + \frac{1}{x}$$

(ج)

$$x^2(1-y) + m(y-1) + (\frac{1}{x} + y) \rightarrow \frac{-y+1 \pm \sqrt{y^2-2y+1-4y^2y-1}}{2-y} \rightarrow y \neq 1$$

$$-4y^2 + 2y \geq 0 \rightarrow \frac{1}{-1} \leq \frac{1}{-1} \leq - \rightarrow R_f = [0, 1)$$

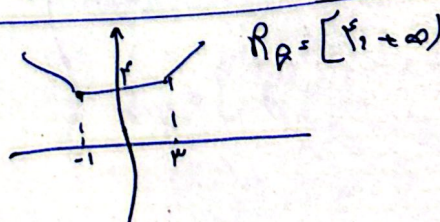
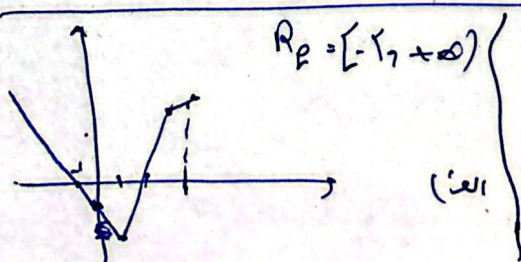
$$\frac{-b}{r_2} = \frac{-f}{r} = 1 \rightarrow 1 \xrightarrow{a < 0} R_f = [-1, \sqrt{r}]$$

(د)

$$\frac{-b}{r_2} = \frac{1}{r} \leq f \rightarrow -1 \xrightarrow{a > 0} R_f = [-1, +\infty)$$

$$x^2 - m + 1 \rightarrow (-\infty, +\infty) \rightarrow \log(0, \infty) = (-\infty, +\infty) = R_f$$

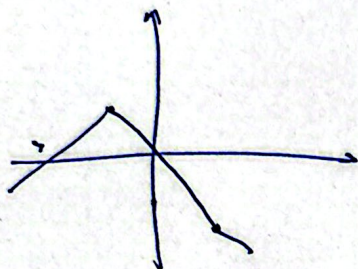
$$n + \frac{1}{n} \rightarrow (-\infty, -1) \cup (1, +\infty) \rightarrow \log_r(1, +\infty) = [1, +\infty) = R_f$$



$$3 \rightarrow -2 / 2 \rightarrow -4 / -1 \rightarrow 3 / -2 \rightarrow 2$$

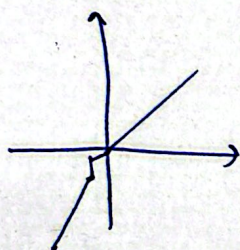
(2)

$$\begin{aligned} | \frac{-1}{3} &, | \frac{-2}{2} \rightarrow m \in \mathbb{R} \quad m = -3 \\ | \frac{-1}{3} &, | \frac{2}{-4} \rightarrow -3m \leq 1 \rightarrow m \leq -\frac{1}{3} \end{aligned} \quad \left\{ \begin{array}{l} (-\infty, -3] \\ R_f = \cup [-\frac{1}{3}, +\infty) \end{array} \right.$$

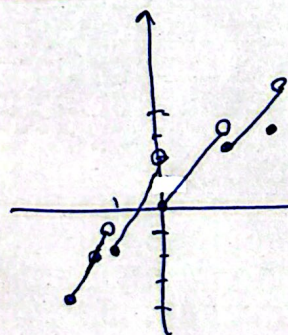


$$-1 \rightarrow -2 / -\frac{1}{3} \rightarrow -1 / 0 \rightarrow -1 / 1 \rightarrow 1$$

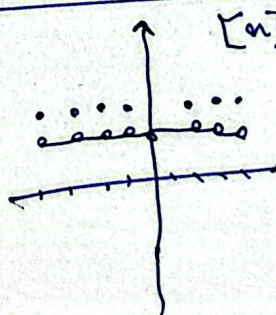
(3)



$$R_f = R$$



$$\begin{aligned} -2 \leq m < -1 &\rightarrow 3m \leq -2 \\ -1 \leq m < 0 &\rightarrow 3m \leq -1 \\ 0 \leq m < 1 &\rightarrow 3m \leq 0 \\ 1 \leq m < 2 &\rightarrow 3m \leq 1 \\ m \geq 2 &\rightarrow 3m \leq 2 \end{aligned}$$



$$[m] + [-m] + 3$$

$$R_f \left\{ \begin{array}{l} 1 \quad m \in \mathbb{Z} \\ 2 \quad m \in \mathbb{Z} \end{array} \right.$$

$$\begin{aligned} 0 &\rightarrow 1 \\ 1 &\rightarrow 3 \end{aligned}$$

$$-\frac{b}{ra} = -\frac{1}{5} \neq \sin \alpha$$

$$R_f = [1, 3]$$

$$-1 \rightarrow 3$$

$$1 \rightarrow 1$$

$$-\frac{b}{ra} \rightarrow \frac{1}{5} \rightarrow \frac{3}{5}$$

$$R_f = [\frac{3}{5}, 3]$$

(11)