

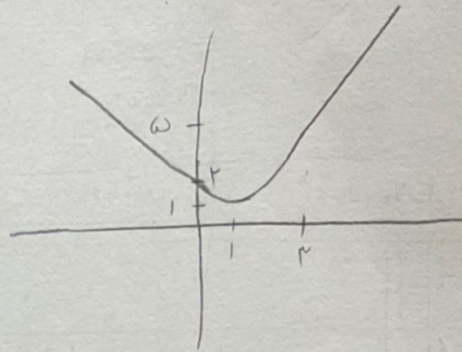
$$y = \frac{x^r + \omega x + m}{x+1} \rightarrow xy + y = x^r + \omega x + m \rightarrow x^r + (\omega - y)x + m - y = 0$$

$$\rightarrow x = \frac{y - \omega \pm \sqrt{(\omega - y)^2 - r(m - y)}}{r} \in \mathbb{R} \rightarrow (\omega - y)^2 - r(m - y) \geq 0$$

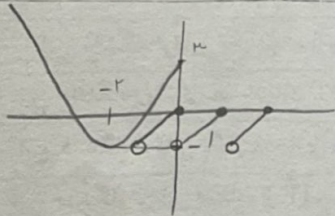
باید همواره مثبت باشد

$$y^r - 10y + r\omega + ry - rm \leq 0 \rightarrow y^r - 9y + r\omega - rm \leq 0 \Rightarrow \boxed{\mathbb{R} \text{ جز } m = \frac{r}{9} \text{ نری}} \quad \text{باید باشد}$$

$$\begin{cases} x+r & x \geq r \rightarrow x \geq 0 \\ x^r - rx + r & 0 \leq x < r \rightarrow -\frac{b}{r} = 1 \rightarrow y = 1 = \min y \\ |x| + r & x < 0 \rightarrow -x + r \end{cases}$$



$$\boxed{R_f = [1, +\infty)}$$



$$x^r + rx + r \quad x \leq 0 \rightarrow -\frac{b}{r} = -r \rightarrow y = -1$$

$$R_I = [-1, +\infty)$$

$$[rx] - rm \rightarrow x > 0 \rightarrow -1 < [rx] - rm \leq 0$$

$$-1 < [rx] - rm \leq 0 \quad R_{II} = (-1, 0]$$

$$R_I \cup R_{II} = \boxed{[-1, +\infty)}$$

$$\begin{aligned} rx + r \geq 0 &\rightarrow rx \geq -r \rightarrow x \geq -\frac{r}{r} \rightarrow b = -\frac{r}{r} \\ -\sqrt{rx+r} &\rightarrow \text{graph} \rightarrow a+1=\omega \rightarrow \underline{a=r} \end{aligned} \quad \left. \vphantom{\begin{aligned} rx + r \geq 0 \\ -\sqrt{rx+r} \end{aligned}} \right\} ab = -\frac{r}{r}(r) = \boxed{-4}$$

