

$$y = \frac{|u|+1}{|u|-r} = \begin{cases} |u| \rightarrow -\frac{1}{r} \\ |u| \rightarrow +\infty \rightarrow 1 \end{cases} \rightarrow \begin{matrix} |u| \rightarrow r \\ k, \pm r \end{matrix} \rightarrow (-\infty, -\frac{1}{r}] \cup (1, +\infty) \quad (1)$$

$$y = \frac{k^r+1}{|u|} \xrightarrow{k^r=|u|^r} y|u| = |u|^r+1 \rightarrow |u|^r - y|u| + 1 \geq 0 \rightarrow \delta > 0 \rightarrow y^r - r \geq 0$$

$$y^r \geq \varepsilon \rightarrow (-\infty, -r] \cup [r, +\infty)$$

$$y = \frac{k^r+k-r}{k+r} \rightarrow yk+r y = k^r+k-r \rightarrow k^r+k(r-y)-r-r y = 0$$

$$(r-y)^r - r(-r-r y) \geq 0 \rightarrow r+y^r-r y + r + r y \geq 0 \rightarrow y^r + r y + r \geq 0$$

$$(y+r)(y+r) \geq 0 \rightarrow \frac{-r-r}{+1-1+} \rightarrow (-\infty, -r] \cup [-r, +\infty)$$

$$y = \frac{k^r-k+\frac{1}{\varepsilon}}{k^r-k+1} \quad D = R \text{ عبارت منبج، ریشه در } \Delta < 0 \quad R \quad (2)$$

$$\text{بر } \rightarrow \frac{(k-\frac{1}{r})^r}{k^r-k+1} \rightarrow [0, +\infty)$$

$$y = \sqrt{k^r+\varepsilon k+1} \quad \begin{cases} -\frac{b}{r a} \leq \frac{-\varepsilon}{-r} \leq r \\ -\varepsilon + r + 1 = 0 \end{cases} \quad \sqrt{(-\infty, 0]} \rightarrow [0, \sqrt{0}] \quad (3)$$

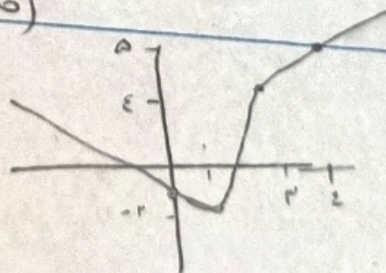
$$y = \sqrt{k^r-r k} \quad \begin{cases} \frac{\Delta}{\varepsilon} \leq r \\ \Delta - 4r - r = 0 \end{cases} \quad \sqrt{[-r, +\infty)} \rightarrow [-r, +\infty)$$

$$y = \log(k^r-k+1) \rightarrow R \rightarrow \log R, (-\infty, +\infty) \quad (4)$$

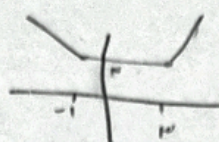
$$y = \log_r(k+\frac{1}{r}) \xrightarrow{k+\frac{1}{r}} [r, +\infty) \xrightarrow{\log} [1, +\infty)$$

$$y = |k-r| - |k-r| \rightarrow \begin{matrix} k < 0 \rightarrow -1 \\ k < 1 \rightarrow -r \\ k < r \rightarrow r \\ k < r \rightarrow 0 \end{matrix}$$

$$R \in [-r, +\infty)$$



$$y = |u-1| + |u+1|$$



$$R = [\varepsilon, +\infty)$$

$$|u-1| + |u+1| \leq 1$$

$$u > 1 \rightarrow -v$$

$$u = 1 \rightarrow -4$$

$$u = -1 \rightarrow 1$$

$$u < -1 \rightarrow 1$$

$$|u-1| + |u+1| \rightarrow -1$$

$$|u-1| + |u+1| = 1 \rightarrow u = -\frac{1}{10}$$

$$|u-1| + |u+1| = 1 \rightarrow u = -1$$

$$R = (-\infty, -1] \cup [-\frac{1}{10}, +\infty) \subseteq R, R = (-1, -\frac{1}{10})$$



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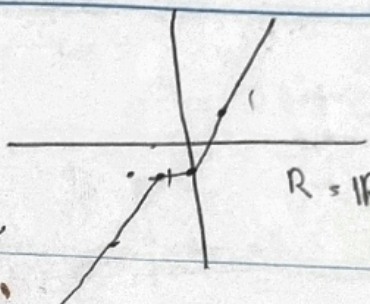
$$y = |u-1| + |u+1| + \frac{1}{10}$$

$$u > 1 \rightarrow -1$$

$$u = 1 \rightarrow 1$$

$$u = -\frac{1}{10} \rightarrow -1$$

$$u < -1 \rightarrow -1$$



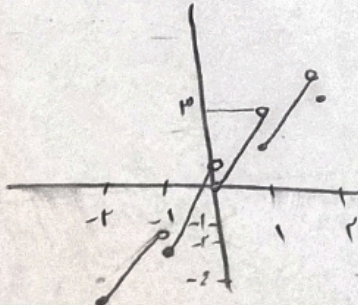
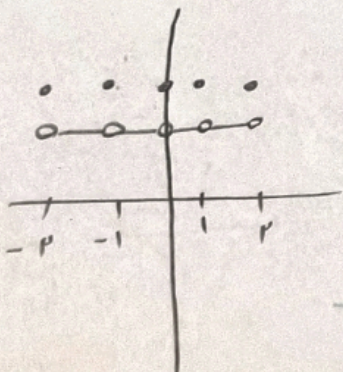
$$R = \mathbb{R}$$

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$$y = [u] + [-u] + 1$$

$$y = |u-1|$$

(19)



$$y = \sin^2 u - \sin u + 1$$

$$\sin u = 1 \rightarrow 1$$

$$\sin u = -1 \rightarrow 1$$

$$\sin u = \frac{1}{2} \rightarrow \frac{1}{4} - \frac{1}{2} + 1 = \frac{3}{4}$$

$$[\frac{3}{4}, 1]$$

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$$y = \sin^2 u + \sin^2 u + 1$$

$$\sin^2 u = 1 \rightarrow 1$$

$$\sin^2 u = 1 \rightarrow 1 \rightarrow [1, 1]$$

$$\sin^2 u = \frac{1}{2} \rightarrow \frac{1}{2}$$