

$$t > 0 \Rightarrow |n| = t \quad t \neq r$$

یادداشتیں

1)

$$y = \frac{|n|+1}{|n|-r} \rightarrow \frac{t+1}{t-r} = \frac{t-r+r}{t-r} = 1 + \frac{r}{t-r}$$

$$\begin{aligned} \bullet \leq t < r &\xrightarrow{|n|=t} \rightarrow y < -\frac{1}{r} \rightarrow (-\infty, -\frac{1}{r}] \\ \rightarrow t > r &\rightarrow y > 1 \rightarrow y \neq 1 \rightarrow (1, +\infty) \end{aligned} \quad \cup \quad (-\infty, -\frac{1}{r}] \cup (1, +\infty)$$

$$y = \frac{n^r+1}{|n|} \quad n \neq 0 \rightarrow t = |n| \rightarrow \frac{t^r+1}{t} = t + \frac{1}{t} \xrightarrow{t=1} t + \frac{1}{t} \geq 2 \rightarrow [2, +\infty)$$

$$2) y = \frac{n^r + rn - r}{n+r} \quad n \neq -r \quad \begin{aligned} y(n+r) &= n^r + rn - r \\ ny + ry &= n^r + rn - r \rightarrow n^r + (r-y)n - (ry+r) = 0 \\ \Delta &= (r-y)^2 - 4(1)(-ry-r) \\ \Delta &= (r-y)^2 + 4ry + 4 \rightarrow y^2 + 4y + 4 \xrightarrow{\Delta \geq 0} (y+2)^2 - 0 \geq 0 \end{aligned}$$

$$(y+2)^2 \geq 0 \rightarrow y+2 \leq -2 \rightarrow y+2 \geq 2 \rightarrow y \leq -4 \rightarrow y \geq -2 \rightarrow (-\infty, -2] \cup [-2, +\infty)$$

$$\leftarrow R_f, D_f \rightarrow \frac{n^r - n + \frac{1}{\varepsilon}}{n^r - n + 1} \rightarrow n^r - n + \frac{1}{\varepsilon} = (n - \frac{1}{r})^r \Rightarrow \frac{(n - \frac{1}{r})^r}{(n - \frac{1}{r})^r + \frac{r}{\varepsilon}} \rightarrow t = \frac{t^r}{t + \frac{r}{\varepsilon}}$$

$$D_f = (n - \frac{1}{r})^r + \frac{r}{\varepsilon} > 0 \rightarrow D_f = \mathbb{R}$$

$$R_f = (n - \frac{1}{r})^r \geq 0 \rightarrow [0, 1)$$

$$\begin{aligned} t = 0 &\rightarrow y = 0 \\ t = +\infty &\rightarrow y = 1 \end{aligned}$$

$$\leftarrow y = \sqrt{-n^r + \varepsilon n - 1}$$

$$\begin{aligned} -n^r + \varepsilon n - 1 &= r - (n-r)^r \rightarrow \sqrt{r - (n-r)^r} \rightarrow \begin{aligned} r - (n-r)^r &\geq 0 \rightarrow r - (n-r)^r \leq r \\ r - (n-r)^r &\leq r \end{aligned} \rightarrow \begin{aligned} \bullet \leq r - (n-r)^r &\leq r \\ \bullet \leq y &\leq \sqrt{r} \end{aligned} \\ R_f &= [0, \sqrt{r}] \end{aligned}$$

$$3) y = \sqrt[r]{r n^r - n n} \rightarrow r n^r - n n = r(n^r - \varepsilon n)$$

$$r[(n-r)^r - \varepsilon] \rightarrow (n-r)^r \geq 0 \rightarrow r[(n-r)^r - \varepsilon] \geq -n$$

$$n \geq 0 \rightarrow [-n, +\infty) \xrightarrow{\sqrt[r]{}} R_f = [-r, +\infty)$$

$$\Rightarrow \log(x^r - x + n)$$

$$x^r - x + n > 0 \rightarrow \mathbb{R}$$

$$b) \log_r \left[\frac{x^r + 1}{x} \right] \quad \left[\log_r^r, +\infty \right) \rightarrow \log_r^r = 1 \rightarrow [1, +\infty)$$

$$y) y = \underbrace{|2n-2|}_{n=1} - \underbrace{|n-3|}_{n=3} \xrightarrow{n \leq 1} |2n-2| = 2-2n \rightsquigarrow y = (2-2n) - (3-n) \\ y = -n-1$$

$$\xrightarrow{n \leq 1} y > -2 \rightarrow (-2, +\infty)$$

$$1 \leq n < 3 \rightarrow 2n-2 - (3-n) \rightarrow 3n-5 \xrightarrow{n=2} 1 < 2 < 3$$

$$\xrightarrow{n=1} y = -2 \rightarrow [-2, 2) \quad \xrightarrow{n > 3} y > 2 \rightarrow (2, +\infty)$$

$$b) |n-3| + |n+1| \quad \text{استاره کرم چیدل} \\ \text{نقطه یی نیست}$$

$$\begin{array}{c|c|c} 2-2n & 1 & 2n-2 \\ \hline y \leq 2 & & y \geq 2 \end{array} \Rightarrow [2, +\infty)$$

$$v) |n-2| - |2n+1| \leq 1$$

$$\begin{array}{c|c|c} 2n-2 & 1 & -n-1 \\ \hline x \leq 2 & & n \geq -1 \end{array} \Rightarrow n \in (-\infty, -3] \cup [-\frac{1}{2}, +\infty)$$

$$h) y = 3n - |2n+1| + |n|$$

$$\begin{array}{c|c|c} -1 & 1 & \\ \hline 2n - (-n-1) & & 2n-1 \\ y = 3n+1 & & \end{array}$$

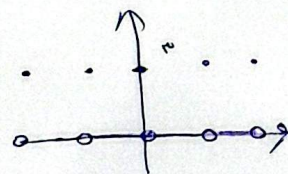
$$\left\{ \begin{array}{ll} 3n+1 & n < -1 \\ x-1 & -1 \leq n < 0 \\ 3n-1 & n \geq 0 \end{array} \right. \quad \mathbb{R}$$

بسیار مهم رابطه یی نیست

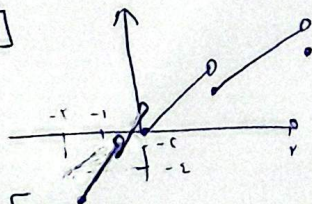
مقدار در بازه $[-2, 2]$

$$q) y = [n] + [3-n]$$

$$R y = \{2, 3\}$$



$$b) 3n - [n]$$



$$1.) \text{ الف) } \sin^2 u - \sin u + 1 \quad \left[\frac{1}{2}, 3 \right]$$

$$\sin^2 u \rightarrow 1-1+1=1 \\ \sin u \rightarrow 1-(-1)+1=3 \\ -\frac{b}{2a} \rightarrow -\frac{-1}{2} = \frac{1}{2} \rightarrow \frac{1}{2} - \frac{1}{2} + \frac{1}{2} = \frac{1}{2}$$

$$b) \sin^2 u + \sin u + 1 \quad [1, 3]$$

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