

$$|n| \rightarrow x_{\max} = +\infty \rightarrow y = 1$$

$$x_{\min} = 0 \rightarrow y = \frac{1}{r}$$

درجه اول

$$R_f: (-\infty, -\frac{1}{r}] \cup (1, +\infty)$$

الف ۱

$$\frac{x^r+1}{|n|} = \frac{|n|^r+1}{|n|} = |n| + \frac{1}{|n|} = a + \frac{1}{a} \xrightarrow{a>0} R_f: [r, +\infty)$$

ب

$$\frac{x^r+r-1}{x+r} \xrightarrow{Df: R-\{r\}} \frac{x^r+r-1}{x+r} = \frac{(x-1)(x+r)+1}{x+r} = x-1 + \frac{1}{x+r}$$

ت

$$x \rightarrow -\infty \rightarrow \frac{1}{x+r} \rightarrow 0 \rightarrow (-\infty, -r] \cup [r, +\infty) \rightarrow R_f: (-\infty, -r] \cup [r, +\infty)$$

$$\frac{x^r-x+\frac{1}{r}}{x^r-x+1} = \frac{x^r-x+a}{x^r-x+1} \xrightarrow{a=\frac{1}{r} \rightarrow y=0} \frac{a+\frac{1}{r}}{a+1} \begin{cases} a=\frac{1}{r} \rightarrow y=0 \\ a=+\infty \rightarrow y=1 \end{cases} \xrightarrow{\text{درجه اول}} R_f: [0, 1]$$

$$a < 0 \rightarrow x_{\max} = +\infty \rightarrow a_{\max} = +\infty$$

$$x_{\min} = \frac{1}{r} \rightarrow a_{\min} = \frac{1}{r}$$

$$Df: R$$

ث

$$a < 0 \rightarrow x_{\max} = r \rightarrow y_{\max} = r \rightarrow \sqrt{(-\infty, r]} \Rightarrow R_f: [0, \sqrt{r}]$$

الف ۲

$$a > 0 \rightarrow x_{\min} = r \rightarrow y_{\min} = -1 \rightarrow \sqrt{[-1, +\infty)} \Rightarrow R_f: [-r, +\infty)$$

ج

$$x^r-x+1 \rightarrow R: \text{برای هر } x \text{ در } R \Rightarrow \log(R) \Rightarrow R_f: R$$

د الف

$$\frac{x^r+1}{x} = x + \frac{1}{x} \xrightarrow{x>0} [r, +\infty) \rightarrow \log_r [r, +\infty) \Rightarrow R_f: [1, +\infty)$$

ه

$$x < 1 \rightarrow y = -x-1$$

$$x > 1, x < r \rightarrow y = r-x-1$$

$$x > r \rightarrow y = x+1$$

$$x=1 \rightarrow y=-r$$

$$x=r \rightarrow y=r$$

$$R_f: [-r, +\infty)$$

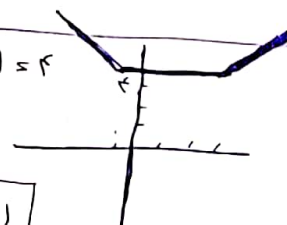


الف

$$x=r \rightarrow y=-(-1)=r$$

$$x=-1 \rightarrow y=-1$$

$$R_f: [r, +\infty)$$



ب

$$x=r-1$$

و

$$\left. \begin{aligned} x < -1 \rightarrow y &\Rightarrow -x+r+r \leq 1 \Rightarrow x+r \leq 0 \Rightarrow x \leq -r \\ r \geq x \geq -1 \rightarrow y &\Rightarrow -x+r-r \leq 1 \Rightarrow -r \leq 0 \Rightarrow x \geq -\frac{1}{r} \\ x > r \rightarrow y &\Rightarrow x-r-r \leq 1 \Rightarrow x-2 \leq 0 \Rightarrow x \leq 2 \end{aligned} \right\} U: Df: [-\infty, -r] \cup [-\frac{1}{r}, +\infty)$$

$$x \leq -\frac{1}{r} \rightarrow y \Rightarrow r \alpha + r \alpha + 1 - x \rightarrow r \alpha + 1$$

$$\rightarrow x > -\frac{1}{r} \rightarrow y \Rightarrow -1$$

$$x > 0 \rightarrow y \Rightarrow r \alpha - r \alpha - 1 + x \rightarrow r \alpha - 1$$



$$R_f: R$$

ز

$$[a] + [-a] + r \begin{cases} x \in \mathbb{Z} \rightarrow [a] + [-a] = 0 \\ x \notin \mathbb{Z} \rightarrow [a] + [-a] = -1 \end{cases} \rightarrow \begin{cases} y=r \\ y=r \end{cases} \rightarrow R_f: \{r, r\}$$

الف ۶

با صفحه ی بعد

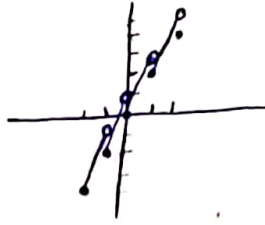
$$x = r \rightarrow y = r^2 x - r$$

$$x = [1, r) \rightarrow y = r^{n-1}$$

$$x = [0, 1) \rightarrow y = r^n$$

$$x = [-1, 0) \rightarrow y = r^{n+1}$$

$$x = [-r, -1) \rightarrow y = r^{n+r}$$



$$R_f = [-f, d)$$

(2)

$$\sin n \begin{cases} +1 \rightarrow y = 1 \\ -1 \rightarrow y = r \\ \frac{-b}{ra} \rightarrow y = \frac{r}{a} \end{cases}$$

$\rightarrow$

$$R_f = \left[\frac{r}{a}, r \right]$$

(2) - 1.

$$\sin^r n \begin{cases} +1 \rightarrow y = r \\ 0 \rightarrow y = 1 \\ \frac{-b}{ra} \rightarrow y = \frac{1}{r} \end{cases}$$

$\rightarrow$

$$R_f = [1, r]$$

(3)