

$$\begin{array}{c} r \\ - \quad | \quad + \\ \downarrow \\ \text{تابع خطی} \end{array}$$

$$\int \underbrace{(a-r)x^r + 0x + b}_{a=r \Rightarrow 0} = \int rx + b \quad] f(x=r) \Rightarrow f(x)=0$$

$$\boxed{r+b=0 \Rightarrow b=-r}$$

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$$f(x) = \sqrt{x^r + rx + r - m^r}$$

$$\left. \begin{array}{l} \max_{m=1} \\ \min_{m=-1} \end{array} \right\} 1 - (-1) = 2$$

$$D_f = \{R\} \Rightarrow x^r + rx + r - m^r \geq 0 \Rightarrow \Delta \leq 0$$

$$r - 1 + rm^r \leq 0 \rightarrow rm^r - r \leq 0 \Rightarrow r(m^r - 1) \leq 0 \Rightarrow r(m+1)(m-1) \leq 0$$

$$\begin{array}{c} -1 \quad 1 \\ + \quad | \quad - \quad | \quad + \\ 0 \quad 0 \end{array}$$

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$$f(x) = \frac{\sqrt{r-x^r}}{[x] + [-x] + 1}$$

$$[x] - [-x] + 1 \begin{cases} x \in \mathbb{Z} \Rightarrow 1 \\ x \notin \mathbb{Z} \Rightarrow 0 \end{cases} \Rightarrow x \in \mathbb{Z}$$

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

$$\begin{array}{c} -r \quad r \\ - \quad | \quad + \quad | \quad - \\ 0 \quad 0 \end{array}$$

$$\rightarrow [-r, r]$$

$$\begin{cases} -2, -1, 0, 1, 2 \end{cases}$$

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$$الف) y = \sqrt{x^r + rx^r} = \sqrt{x^r(x+r)} \Rightarrow x^r(x+r) \geq 0$$

$$\begin{array}{c} -r \quad 0 \\ - \quad | \quad + \quad | \quad + \\ 0 \quad 0 \end{array} \rightarrow D_f = [-r, +\infty)$$

$$ب) y = \sqrt{\frac{(x^r-1)(x^r-x^r)}{x^r-1}} = \frac{(x^r-1)(x^r-x^r)}{x^r-1} \geq 0$$

$$\frac{(x-1)(x+1)(x^r)(x-r)}{x^r-1} \geq 0$$

$$\begin{array}{c} -1 \quad 0 \quad 1 \quad r \\ + \quad | \quad - \quad | \quad - \quad | \quad + \\ 0 \quad 0 \end{array} \quad D_f = (-\infty, -1] \cup [r, +\infty) \cup \{0, 1\}$$

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$$د) y = \sqrt{|x-r|-r} \Rightarrow |x-r|-r \geq 0$$

$$|x-r| \geq r \Rightarrow x-r \geq r \Rightarrow x \geq 2r$$

$$x-r \leq -r \Rightarrow x \leq -1$$

$$D_f = (-\infty, -1] \cup [2r, +\infty)$$

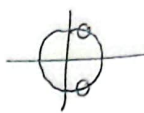
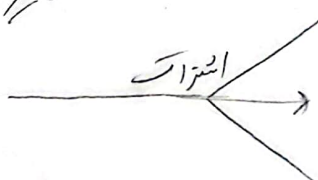
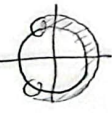
$$ه) y = \sqrt{r-|r-x|} \Rightarrow r-|r-x| \geq 0$$

$$r \geq |r-x| \Rightarrow r \geq r-x \geq -r$$

$$r \geq -x \geq -r \Rightarrow -r \geq x \geq -r$$

$$D_f = [-r, r]$$

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$a) y = \sqrt{1-x x } \Rightarrow 1-x x \geq 0$ $\begin{array}{c} + \\ 1 \\ - \\ 0 \end{array}$ $D_f = (-\infty, 1]$	$b) \frac{1}{\sqrt{r- x-\omega -1}} \rightarrow r- x-\omega > 0$ $r > x-\omega \Rightarrow r > x-\omega > -r$ $r > x > -r \quad D_f = (r, -r)$	8
$a) y = \frac{\sin^2 x - 1}{\cos x} \rightarrow \cos x \neq 0$  $D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2} \right\}$	$b) y = \frac{\cos 2x}{x \cos x - 1} \rightarrow x \cos x - 1 \neq 0$ $\cos x \neq \frac{1}{x}$  $D_f = \mathbb{R} - \left\{ 2k\pi - \frac{\pi}{x}, 2k\pi + \frac{\pi}{x} \right\}$	9
$a) y = \frac{x+r}{ x+1 - x+r } \Rightarrow x+1 - x+r \neq 0$ $ x+1 \neq x+r $ $x^2 + x + 1 \neq x^2 + 2x + r$ $x^2 - 2x - r \neq 0$ $x^2 - 2x - r \neq 0 \Rightarrow (x-1)(x+r) \neq 0 \Rightarrow x \neq \frac{r-1}{r}$ $D_f = \mathbb{R} - \left\{ \frac{r-1}{r} \right\}$	$b) y = \sqrt{ x+1 - x+r } \Rightarrow x+1 - x+r \geq 0$ $ x+1 \geq x+r \Rightarrow x^2 + x + 1 \geq x^2 + 2x + r$ $x^2 - 2x - r \geq 0 \Rightarrow (x-1)(x+r) \geq 0$ $\begin{array}{c} -\frac{r}{r} \\ + \quad 1 \\ 0 \end{array} \quad \begin{array}{c} r \\ - \quad 1 \\ 0 \end{array} \quad +$ $D_f = (-\infty, \frac{r-1}{r}] \cup [r, +\infty)$	10
$f(x) = \sqrt{\log_{\log_{\frac{1}{10}}}(x-1)} \Rightarrow \log_{\log_{\frac{1}{10}}}(x-1) \geq 0$ $\log_{\frac{1}{10}}(x-1) > 0 \quad x-1 > 1 \Rightarrow x > 2$ $\log_{\log_{\frac{1}{10}}}(x-1) \geq 0 \quad \log_{\frac{1}{10}}(x-1) \geq 1 \quad (x-1) \geq 10 \Rightarrow x \geq 11$	$x-1 > 0 \Rightarrow x > 1$  $D_f = [11, +\infty)$	11
$a) y = \log(x \cos x + 1)$ $x \cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{x}$  $D_f = \left(2k\pi - \frac{\pi}{x}, 2k\pi + \frac{\pi}{x} \right)$	$b) y = \sqrt{\log \frac{x-1}{x+1}} \rightarrow \frac{x-1}{x+1} > 0$ $\log \frac{x-1}{x+1} \geq 0 \quad \frac{x-1}{x+1} \geq 1 \rightarrow \frac{-r}{x+1} \geq 0$ $\begin{array}{c} -1 \\ + \quad \frac{1}{x} \\ 0 \end{array} \quad \begin{array}{c} 1 \\ - \quad \frac{1}{x} \\ 0 \end{array} \quad +$ $D_f = (-\infty, -1)$	12