

۲۰. از این جواب نوشتی بهتر است برای D بنویسی D و D ت

الف) $y = \frac{x+3}{2x^3+9x^2+10x+3} \rightarrow$ جفتی زیر بر $x+1$

$y = \frac{x+3}{(x+1)(2x+1)(x+3)} \rightarrow D = \mathbb{R} - \left\{ -1, -\frac{1}{2}, -3 \right\}$

ب) $y = \frac{x+3}{2x^3+3x^2-8x+3} \rightarrow$ مجموع ضرایب صفر

$y = \frac{x+3}{(x-1)(2x^2+5x-3)} = \frac{x+3}{(x-1)(x+3)(2x-1)}$
 $D = \mathbb{R} - \left\{ 1, \frac{1}{2}, -3 \right\}$

الف) $y = \sqrt{\frac{x+3}{x^3-2x^2+2x-1}} = \sqrt{\frac{x+3}{(x-1)(x^2-x+1)}}$

همواره مثبت
 زیرا: $\Delta < 0$ و $a > 0$
 $D = (-\infty, -3] \cup (1, +\infty)$

ب) $y = \frac{x+3}{x^3-2x^2+2x-1} = \frac{x+3}{(x-1)(x^2-x+1)}$

$\Delta < 0$
 $D = \mathbb{R} - \{ \text{ریشه منجم} \}$
 $D = \mathbb{R} - \{ 1 \}$

منجم نباید صفر شود:
 $y = \frac{2}{x^2-5|x-1|-2x+5}$

$x^2-2x+5 = 5|x-1|$
 $\begin{cases} x \geq 1 \rightarrow x^2-2x+5 = 5x-5 \rightarrow x^2-7x+10=0 \\ (x-5)(x-2)=0 \end{cases} \rightarrow \begin{matrix} x=2 \\ x=5 \end{matrix}$
 $\begin{cases} x < 1 \rightarrow x^2-2x+5 = -5x+5 \rightarrow x^2+3x=0 \\ x(x+3)=0 \end{cases} \rightarrow \begin{matrix} x=0 \\ x=-3 \end{matrix}$
 $D = \mathbb{R} - \{ 0, -3, 2, 5 \}$

الف) $y = \frac{5x^2+4}{[x]^2-2[x]-3}$

منجم نباید صفر شود:
 $[x]^2-2[x]-3 \neq 0 \rightarrow ([x]-3)([x]+1) \neq 0$
 $[x] \neq 3 \rightarrow x \notin [3, 4)$
 $[x] \neq -1 \rightarrow x \notin [-1, 0)$
 $D = (-\infty, -1) \cup$

ب) $y = \sqrt{[-x]-2}$

$[-x]-2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow$
 $-x \geq 2 \rightarrow x \leq -2 \rightarrow D = (-\infty, -2]$
 $[0, 3] \cup [4, +\infty)$

الف) $y = \sqrt{\left[x - \frac{1}{3}\right] + \left[\frac{1}{3} - x\right]}$

$[t] + [-t] \begin{cases} t \in \mathbb{Z} \rightarrow 0 \checkmark \geq 0 \\ t \in \mathbb{R} - \mathbb{Z} \rightarrow -1 \times < 0 \end{cases}$
 $t \in \mathbb{Z} \rightarrow x - \frac{1}{3} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{3}$

$D = \left\{ x \mid x = k + \frac{1}{3}, k \in \mathbb{Z} \right\}$

ب) $y = \sqrt{\left[x - \frac{1}{3}\right] + \left[x + \frac{2}{3}\right]} \geq 0$

می توانیم اعداد صحیح را از برکالت خارج یابیم و برکالت وارد کنیم:
 $\left[x - \frac{1}{3}\right] + \left[x + \frac{2}{3}\right] + 1 \geq 1$
 $2\left[x + \frac{2}{3}\right] \geq 1 \rightarrow \left[x + \frac{2}{3}\right] \geq \frac{1}{2}$
 $x + \frac{2}{3} \geq 1 \rightarrow x \geq \frac{1}{3} \rightarrow D = \left[\frac{1}{3}, +\infty\right)$

$D = \left[\frac{1}{3}, +\infty\right)$

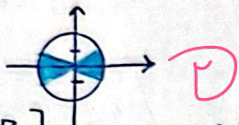
$$y = \sqrt{1 - r \sin^2 x}$$

$$1 - r \sin^2 x \geq 0 \rightarrow r \sin^2 x \leq 1 \rightarrow \sin^2 x \leq \frac{1}{r}$$

$$-\frac{1}{\sqrt{r}} \leq \sin x \leq \frac{1}{\sqrt{r}}$$

$$[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}] \cup$$

$$D = [2k\pi - \frac{\pi}{4}, 2k\pi + \frac{\pi}{4}] \cup [2k\pi + \frac{3\pi}{4}, 2k\pi + \frac{5\pi}{4}]$$



$$y = \sqrt{1 - r \cos^2 x}$$

$$1 - r \cos^2 x \geq 0 \rightarrow r \cos^2 x \leq 1 \rightarrow \cos^2 x \leq \frac{1}{r}$$

$$D = \mathbb{R} - (2k\pi - \frac{\pi}{3}, 2k\pi + \frac{\pi}{3})$$



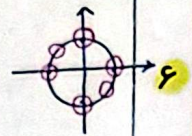
$$y = \frac{\cot x + 1}{\tan x + 1}$$

$$\cot x = \frac{\cos x}{\sin x} \rightarrow \sin x \neq 0$$

$$\tan x = \frac{\sin x}{\cos x} \rightarrow \cos x \neq 0$$

$$\tan x \neq -1 \rightarrow D = \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi - \frac{\pi}{4} \right\}$$

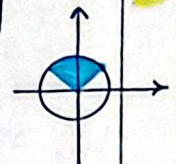
مخرج ها نباید صفر شوند



$$y = \sqrt{r \sin x - 1}$$

$$r \sin x - 1 \geq 0 \rightarrow r \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{r}$$

$$D = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$$



$$\cos y = \sqrt{a - 2x}$$

$$a - 2x \geq 0 \rightarrow 2x \leq a \rightarrow x \leq \frac{a}{2}$$

$$-1 \leq \sqrt{a - 2x} \leq 1 \rightarrow a - 2x \leq 1 \rightarrow x \geq \frac{a-1}{2}$$

همواره برقرار

$$D = [\frac{a-1}{2}, \frac{a}{2}]$$

$$y = \arcsin(x^2 + 3x + 1)$$

$$-1 \leq x^2 + 3x + 1 \leq 1$$

$$\begin{aligned} x^2 + 3x + 1 &\leq 1 \rightarrow x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow x \in [-3, 0] \\ x^2 + 3x + 1 &\geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0 \rightarrow x \in (-\infty, -2] \cup [-1, \infty) \end{aligned}$$

$$D = [-3, -1]$$

$$y = \log_r(1 - \log_{\frac{x}{r}}) > 0 \rightarrow x > 0$$

$$1 - \log_{\frac{x}{r}} > 0 \rightarrow \log_{\frac{x}{r}} < 1 \rightarrow x > \frac{1}{r}$$

$$D = (\frac{1}{r}, +\infty)$$

$$y = \log_r(1 - \log_{\frac{x}{r}}) > 0 \rightarrow x > 0 \quad (I)$$

$$1 - \log_{\frac{x}{r}} > 0 \rightarrow \log_{\frac{x}{r}} < 1 \rightarrow x < r \quad (II)$$

$$(I) \cap (II) \rightarrow 0 < x < r \rightarrow D = (0, r)$$

$$y = \left(\frac{rx + a}{rx + r} \right)!$$

$$\frac{rx + a}{rx + r} \in \mathbb{W} \rightarrow x \in \frac{-r\mathbb{W} + a}{r\mathbb{W} - r}$$

$$D = \left\{ x \mid x = \frac{-rk + a}{rk - r}, k \in \mathbb{W} \right\}$$

$$y = \sqrt{r^k x - x^r}$$

$$r^k x - x^r \geq 0 \rightarrow x \geq \frac{x^r}{r^k} \rightarrow x^{r-k} \geq \frac{1}{r^k}$$

$$r^k x - x^r \geq r^3 \rightarrow x^r - rx + r^3 \leq 0 \rightarrow (x-1)(x-3) \leq 0$$

$$D = [1, 3]$$