

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

$$D = R - \left\{ \frac{1}{2}, -\frac{1}{2} \right\}$$

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$$y = \frac{x + 3}{x^2 - 2x - 1} \rightarrow (x+1)(x^2 + 7x + 3)$$

$$D = R - \left\{ -1, -\frac{1}{2}, -\frac{3}{2} \right\}$$

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

$$y = \sqrt{\frac{x + 3}{x^2 - 2x - 1}} \rightarrow \frac{x + 3}{x - 1} \geq 0, x \neq 1 \rightarrow D = (-\infty, -3] \cup (1, +\infty)$$

$$y = \frac{2}{x^2 - 5x + 1} \rightarrow x^2 - 5x + 1 = 0 \rightarrow x = \frac{5 \pm \sqrt{25 - 4}}{2} = \frac{5 \pm \sqrt{21}}{2}$$

$$D = R - \left\{ \frac{5 + \sqrt{21}}{2}, \frac{5 - \sqrt{21}}{2} \right\}$$

$$y = \sqrt{[-x] - 2} \rightarrow [-x] - 2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow -x \geq 2 \rightarrow x \leq -2$$

$$D = (-\infty, -2]$$

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

$$D = (-\infty, -1) \cup (0, 3) \cup (4, +\infty)$$

$$(x^2 - 3)(x^2 + 1)$$

$$x^2 \rightarrow [x] = 3 \rightarrow x \in [3, 4)$$

$$[x] = -1 \rightarrow x \in [-1, 0)$$

$$y = \sqrt{\left\lceil x - \frac{1}{p} \right\rceil + \left\lfloor x + \frac{1}{p} \right\rfloor} \rightarrow \left\lceil x - \frac{1}{p} \right\rceil + 1 \geq 0 \rightarrow \left\lceil x - \frac{1}{p} \right\rceil \geq -1 \rightarrow \left\lceil x - \frac{1}{p} \right\rceil \geq 0$$

$$y = \sqrt{\left\lceil x - \frac{1}{p} \right\rceil + \left\lfloor \frac{1}{p} - x \right\rfloor}$$

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

$$\left\lceil x - \frac{1}{p} \right\rceil + \left\lfloor \frac{1}{p} - x \right\rfloor \geq 0$$

$$\left\lceil t \right\rceil + \left\lfloor -t \right\rfloor \geq 0$$

$$\text{if } t = 2 \rightarrow \checkmark$$

$$\text{if } t = -1, 0 \rightarrow \left\lceil t \right\rceil = 2$$

$$-t = x, 0 \rightarrow \left\lfloor -t \right\rfloor = -3$$

$$D = \mathbb{Z}$$

$$\frac{1}{p} + n \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{p}$$

$$D \neq \left\{ n \mid n = k + \frac{1}{p}, k \in \mathbb{Z} \right\}$$

$$y = \frac{\cot x + 1}{\tan x + 1} \rightarrow \tan x \neq -1 \quad D = \mathbb{R} \setminus \{x \mid x = k\pi - \frac{\pi}{4}, k \in \mathbb{Z}\}$$

$$a) y = \sqrt{1 - \epsilon \sin x} \quad \sin x \leq \frac{1}{\epsilon} \quad -\frac{1}{\epsilon} \leq \sin x \leq \frac{1}{\epsilon} \quad D: x \in [k\pi - \frac{\pi}{2}, k\pi + \frac{\pi}{2}] (k \in \mathbb{Z})$$

$$b) y = \sqrt{1 - \epsilon \cos x} \rightarrow \cos x \geq \frac{1}{\epsilon} \quad D: x \in [k\pi, k\pi + \frac{\pi}{2}] (k \in \mathbb{Z})$$

$$c) y = \sqrt{1 - \epsilon \cos x} \quad \cos x \leq \frac{1}{\epsilon} \quad D: x \in [k\pi + \frac{\pi}{2}, k\pi + \pi] (k \in \mathbb{Z})$$

$$a) y = \arcsin(x^2 + 2x + 1) \quad x^2 + 2x + 1 \leq 1 \rightarrow x(x+2) \leq 0 \rightarrow x \in [-2, 0] \quad D: [-2, 0]$$

$$b) \cos y = \sqrt{5 - 2x} \rightarrow 0 \leq 5 - 2x \leq 1 \rightarrow 2 \leq x \leq 5 \quad D: [2, 5]$$

$$y = \log_r(1 - \log_r x) \rightarrow 1 - \log_r x > 0 \rightarrow \log_r x < 1 \rightarrow x < r \quad D: 0 < x < r$$

$$b) \log_r(1 - \log_r x)^{x y_0} \quad 1 - \log_r x > 0 \rightarrow \log_r x < 1 \rightarrow x < r \quad D: x < r$$

$$a) \sqrt{r^x \cdot x^r - 1} \quad r^x + x - x^r \geq 1 \rightarrow r^x - x^r \geq 1 - x \rightarrow -x^r + x - 1 \geq -x \rightarrow x^r - x + 1 \leq 0 \rightarrow (x-1)(x-r) \leq 0 \quad D = [1, r]$$

$$b) y = \left(\frac{r^x + \omega}{r^x + \epsilon} \right) \quad D = \left\{ \frac{\omega - \epsilon n}{r^n - r} \mid n \in \mathbb{Z}_{\geq 0} \right\}$$

$$r^x + \omega = n(r^x + \epsilon) \rightarrow x = \frac{\omega - \epsilon n}{r^n - r}$$

$$\omega - \text{ب} \quad \left[n - \frac{1}{r} \right] + \left[-n + \frac{1}{r} \right] \geq 0$$

مردانیم:

$$\begin{aligned} [n] + [-n] & \begin{cases} \rightarrow n \in \mathbb{Z} & 0 \checkmark \\ \rightarrow n \notin \mathbb{Z} & -1 \times \end{cases} \end{aligned}$$

$$\rightarrow \left[n - \frac{1}{r} \right] \in \mathbb{Z} \rightarrow n \in \mathbb{Z} + \frac{1}{r}$$

$$D \neq \left\{ n \mid n = k + \frac{1}{r}, k \in \mathbb{Z} \right\}$$