

$$y = \sqrt{\frac{x^4 - 1}{x^3 - x}} \geq 0 \quad \frac{x^4 - 1}{x^3 - x} \geq 0 \quad \frac{(x-1)(x^3 + x + 1)}{x(x-1)(x+1)}$$

$$\frac{-1 \quad 0 \quad 1}{+ \quad - \quad +} \quad D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$$

$$b) y = \sqrt{\frac{x^2 - 14}{x^2 - 2x + 2}} \geq 0 \quad \frac{x^2 - 14}{x^2 - 2x + 2} \geq 0 \quad \frac{(x-2)(x+2)}{(x-1)(x-1)}$$

$$\frac{-2 \quad 1 \quad 2}{+ \quad - \quad +} \quad (-\infty, -2) \cup (1, 2) \cup (2, +\infty)$$

$$a) y = \sqrt{2 - \sqrt{2 - x}} \quad 2 - x \geq 0, \quad x \leq 2 \quad -\omega$$

$$2 - \sqrt{2 - x} \geq 0 \quad \sqrt{2 - x} \leq 2 \rightarrow 2 - x \leq 4$$

$$\rightarrow -x \leq 2 \rightarrow x \geq -2$$

$$D_f = [-2, 2]$$

$$b) y = \sqrt{3 - \sqrt{x - 2}} \quad x - 2 \geq 0 \rightarrow x \geq 2$$

$$3 - \sqrt{x - 2} \geq 0 \rightarrow \sqrt{x - 2} \leq 3, \quad x - 2 \leq 9 \quad x \leq 11$$

$$D_f = [2, 11]$$



$$\text{الف) } y = \sqrt{8 - 2x^2} \quad 8 - 2x^2 \geq 0 \quad 2x^2 \leq 8 \rightarrow x^2 \leq 4$$

$$-\sqrt{4} \leq x \leq \sqrt{4}$$

$$D_f = [-2, 2]$$

$$\text{ب) } y = \sqrt{3|x| - 9} \quad 3|x| - 9 \geq 0 \rightarrow 3|x| \geq 9$$

$$|x| \geq 3 \quad x \leq -3 \quad |$$

$$x \geq 3$$

$$D_f = (-\infty, -3] \cup [3, +\infty)$$

$$\text{الف) } y = 3 \sqrt{\frac{|x|+1}{|x|-3}} \rightarrow |x| - 3 \neq 0 \quad |x| \neq 3$$

$$x \neq \pm 3 \quad D_f = \mathbb{R} - \{-3, 3\}$$

$$\text{ب) } y = 3 \sqrt{\frac{\sqrt{|x|}+1}{\sqrt{|x|}-3}} \quad x \geq 0, \quad \sqrt{|x|} - 3 \neq 0 \rightarrow \sqrt{x} \neq 3$$

$$x \neq 9 \quad D_f = [0, 9) \cup (9, +\infty)$$



$$w) y = \frac{\sin x}{r \cos x - 1} \rightarrow r \cos x - 1 \neq 0 \quad - \Delta$$

$$r \cos x \neq 1 \rightarrow \cos x \neq \frac{1}{r}$$

$$D_f = \mathbb{R} - \left\{ k\pi \pm \frac{\pi}{r} \right\}$$

$$1) y = \frac{\cos x + 1}{r \sin x + 1} \quad r \sin x + 1 \neq 0 \rightarrow r \sin x \neq -1$$

$$\sin x \neq -\frac{1}{r} \quad D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{r}, k\pi + \frac{3\pi}{r} \right\}$$

$$2) y = \frac{\tan x + r}{\cot x - 1} \quad \cot x - 1 \neq 0 \rightarrow \cot x \neq 1$$

$$\frac{\cos x}{\sin x} \rightarrow \sin x \neq 0 \quad \hookrightarrow \frac{\cos x}{\sin x} \neq 1$$

$$D_f = \mathbb{R} - \left[\{k\pi\} \cup \left\{ k\pi + \frac{\pi}{r} \right\} \cup \left\{ k\pi + \frac{\pi}{r} \right\} \right]$$

$$3) y = \frac{\sin^2 x + 1}{\varepsilon \sin^2 x - \mu} \quad \varepsilon \sin^2 x - \mu \neq 0 \quad \& \sin^2 x \neq \mu$$

$$\sin^2 x \neq \frac{\mu}{\varepsilon} \quad D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{\mu}, k\pi + \frac{\pi}{\mu} \right\}$$

$$y = \frac{1}{\sqrt{r|x-r| - \frac{1}{r}}} \rightarrow r|x-r| - \frac{1}{r} > 0 \quad r|x-r| > \frac{1}{r} \quad - \Delta$$

$$|x-r| > \frac{1}{\varepsilon} \rightarrow x-r > \pm \frac{1}{\varepsilon} \quad D_f = (-\infty, \frac{r}{\varepsilon}) \cup (\frac{r}{\varepsilon}, +\infty)$$

$$x > \frac{r}{\varepsilon}, \quad x < \frac{r}{\varepsilon}$$

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$$1) \text{ if } y_2 = \sqrt{\varepsilon - r|m|} \quad \varepsilon - r|m| \geq 0 \quad r|m| \leq \varepsilon \quad -1$$

$$2) |m| \leq r \quad \rightarrow \quad -r \leq r \quad \text{if } r = [-r, r]$$

$$3) \text{ if } y = \sqrt{\frac{|m|}{|m|}} \quad \rightarrow \quad -|m| \leq 0, \quad m \neq 0$$

$$4) \text{ if } z = (-\infty, 0) \cup (0, +\infty)$$