

$$y = \sqrt{y \sin x - 1} \Rightarrow y \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{y}$$

$$D_f = \left[yk\pi + \frac{\pi}{2}, yk\pi + \frac{5\pi}{2} \right]$$

$$y = \sqrt{\cos x - 1} \quad D_f = \{ yk\pi \}$$

$$\cos x - 1 \geq 0 \Rightarrow \cos x \geq 1$$

$$\cos y = |x| - 3 \quad x \in [-4, -2] \cup [2, 4]$$

$$-1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4$$

$$y = \arcsin(x^2 + 3x + 1) \quad x^2 + 3x + 1 \geq \frac{-3}{2} \Rightarrow x(x+3) \leq 0$$

$$-1 \leq x^2 + 3x + 1 \leq 1 \quad x^2 + 3x + 2 \geq 0 \quad D_f = [-3, -2] \cup [-1, 0]$$

$$(x+1)(x+2) \geq 0$$

$$y = \sqrt{y - \log_2(x-2)} \quad y - \log_2(x-2) \geq 0 \quad x-2 \leq 9 \Rightarrow x \leq 11$$

$$x-2 > 0 \Rightarrow x > 2 \quad \log_2(x-2) \leq y \quad 2 \leq x \leq 11$$

$$y = \log(x^3 - x) \quad (-1, 0) \cup (1, \infty)$$

$$x^3 - x > 0 \Rightarrow x(x-1)(x+1) > 0$$

$$y = \frac{r}{r^x + 1} \quad y = \frac{r}{r^x - 1}$$

IR

$$r^x - 1 \neq 0 \Rightarrow r^x \neq 1$$

$$x \neq 0 \quad \mathbb{R} - \{0\}$$

$$r^x - r \neq 0 \Rightarrow r^x \neq r$$

$$x \neq \log_r r$$

$$\mathbb{R} - \{\log_r r\}$$

$$y = (x+1)!$$

$$x+1 \in \mathbb{N}$$

$$x \in \mathbb{N} - 1$$

$$D_f = \left\{ x \mid x = \frac{k-1}{r}, k \in \mathbb{N} \right\}$$

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

$$\frac{rx-y}{rx-a} \in \mathbb{N}$$

$$rx-y \in \mathbb{N} \Rightarrow rx-a \in \mathbb{N}$$

$$rx-y \in \mathbb{N} \Rightarrow rx-a \in \mathbb{N}$$

$$x \in \frac{r-a}{r-y}$$

۳- الف

$$\left[n - \frac{1}{r}\right] + \left[n + \frac{r}{r}\right] \geq 0 \rightarrow \left[n - \frac{1}{r}\right] + \left[n - \frac{1}{r}\right] \geq -1 \rightarrow 2\left[n - \frac{1}{r}\right] \geq -1$$

$$\left[n - \frac{1}{r}\right] \geq -\frac{1}{2} \rightarrow n - \frac{1}{r} \geq 0 \rightarrow n \geq \frac{1}{r}$$