

$$\text{الف) } y = \sqrt{2 \sin x - 1} \geq 0$$

$$\sin x \geq \frac{1}{2}$$

$$D_f = \left[\frac{1}{2} + \frac{\pi}{2}, \frac{3}{2} + \frac{\pi}{2} \right] \quad \text{با توجه به تناوبی}$$

$$\text{ب) } y = \sqrt{\cos x - 1} \geq 0$$

$$\cos x \geq 1$$

$$D_f = \{2k\pi\}$$

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$$\text{الف) } \cos y = |x| - 3$$

$$-1 \leq |x| - 3 \leq 1$$

$$2 \leq |x| \leq 4$$

$$-4 \leq x \leq -2 \quad D_f = [-4, -2] \cup [2, 4]$$

$$\text{ب) } \arcsin(x^2 + 3x + 1)$$

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

$$\frac{-3 \pm \sqrt{9 - 4}}{2} \quad (x+1)(x+2) \geq 0$$

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

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$$\text{الف) } y = \sqrt{2 - \log_3(x-2)}$$

$$x-2 > 0 \quad x > 2$$

$$2 - \log_3(x-2) \geq 0 \quad D_f = (2, 11]$$

$$\log_3(x-2) \leq 2 \quad x-2 \leq 9 \quad x \leq 11$$

$$\text{ب) } y = \log(x^2 - x)$$

$$x^2 - x > 0$$

$$x(x+1)(x-1) > 0$$

$$\frac{-1 \pm 1}{2} \quad D_f = (-1, 0) \cup (1, +\infty)$$

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$$\text{الف) } y = \frac{3}{e^x + 1} \neq 0 \quad e^x \neq -1 \quad D_f = \mathbb{R}$$

$$\text{ب) } y = \frac{3}{e^x - 1} \neq 0 \quad e^x \neq 1 \quad x \neq 0$$

$$D_f = \mathbb{R} - \{0\}$$

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$$\text{ج) } y = \frac{3}{e^x - 2} \neq 0 \quad e^x \neq 2 \quad x \neq \log_2 2 \quad D_f = \mathbb{R} - \{\log_2 2\}$$

$$\text{د) } y = \frac{3}{e^x - 2} \neq 0 \quad e^x \neq 2 \quad x \neq \log_2 2 \quad D_f = \mathbb{R} - \{\log_2 2\}$$

$$\text{الف) } y = (e^x + 1)!$$

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

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

$$D_f = \{x | x = \frac{k-1}{e}, k \in \mathbb{W}\}$$

$$\text{ب) } y = \left(\frac{3x-2}{2x-5} \right)! \in \mathbb{W}$$

$$\frac{3x-2}{2x-5} \in \mathbb{W} \quad D_f = \{x | x = \frac{2-5k}{3-2k}, k \in \mathbb{W}\}$$

$$3x-2 \in 2x-5 \quad x \in \mathbb{W}$$

$$x(3-2) \in 2-5 \quad x \in \mathbb{W}$$

$$x \in \frac{2-5\mathbb{W}}{3-2\mathbb{W}}$$

