

subject

Year Month Date

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17, 75

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$$\text{الف) } y = \sqrt{4-x} \Rightarrow D_f = [-14, 2] \checkmark$$

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

$$4-\sqrt{2-x} \geq 0 \rightarrow \sqrt{2-x} \leq 4 \rightarrow 2-x \leq 14 \rightarrow -x \leq 14 \rightarrow x \geq -14$$

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$$\text{ب) } \sqrt{2-x} \rightarrow D_f = [2, 11] \checkmark$$

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

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

③ ④ ⑤

$$\text{الف) } y = \sqrt{4-x^2} \rightarrow 4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow x \leq 2 \rightarrow -\sqrt{4} \leq x \leq \sqrt{4} \rightarrow D_f = [-2, 2] \checkmark$$

$$\text{ب) } y = \sqrt{3|x|-9} \rightarrow 3|x|-9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow \begin{cases} x \geq 3 \\ x \leq -3 \end{cases} \Rightarrow D_f = (-\infty, -3] \cup [3, +\infty) \checkmark$$

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$$\text{الف) } y = \sqrt[3]{\frac{|x|+1}{|x|-3}} \rightarrow |x|-3 \neq 0 \rightarrow |x| \neq 3 \rightarrow x \neq 3, x \neq -3 \Rightarrow D_f = \mathbb{R} - \{-3, 3\} \checkmark$$

$$\text{ب) } y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \rightarrow \sqrt{x} \geq 0 \rightarrow [0, +\infty) \rightarrow \sqrt{x}-3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9 \Rightarrow D_f = ([0, +\infty) - \{9\}) \checkmark$$

$$\text{الف) } y = \sqrt{\frac{3-|x|}{|x|+2}} \rightarrow 3-|x| \geq 0 \rightarrow |x| \leq 3 \rightarrow x \leq 3, x \geq -3 \Rightarrow [-3, 3] \rightarrow |x|+2 \neq 0 \rightarrow |x| \neq -2 \Rightarrow \mathbb{R} \Rightarrow D_f = [-3, 3] \checkmark$$

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$$\text{ب) } y = \sqrt{\frac{4-x^2}{|x|-1}} \rightarrow 4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2 \rightarrow [-2, 2] \rightarrow |x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq 1, x \neq -1 \Rightarrow \mathbb{R} - \{-1, 1\} \Rightarrow D_f = [-2, 2] - \{\pm 1\} \checkmark$$

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$$\text{الف) } y = \frac{x+1}{\sqrt{x+|x|}} \rightarrow x+|x| \geq 0 \Rightarrow x \geq -|x| \rightarrow \mathbb{R} \Rightarrow D_f = (0, +\infty) \checkmark$$

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$$\text{ب) } y = \frac{1}{\sqrt{x|x|}} \rightarrow x|x| \geq 0 \Rightarrow D_f = (0, +\infty) \checkmark$$

$$\text{الف) } y = \sqrt{2-[x]} \rightarrow 2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow D_f = (-\infty, 2) \checkmark$$

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$$\text{ب) } y = \frac{1}{\sqrt{2-[x]}} \rightarrow 2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow (-\infty, 2) \checkmark$$

①

الف) $y = \frac{1}{x[x]} \Rightarrow x[x] \neq 0$ این ها همواره مثبت است
 $D_f = \mathbb{R} - \{0\}$ یا $D_f = (-\infty, 0) \cup (0, +\infty)$ ✓

ب) $y = \frac{1}{\sqrt{-x[x]}} \Rightarrow -x[x] > 0 \Rightarrow -x > [x] \Rightarrow D_f = (-\infty, 0)$ خود [x] همواره هم علامت هستند ← ضرب آنها هیچ وقت منفی نمی شود!
 $D_f = \emptyset$ ✗

②

الف) $y = \sqrt{[x - \frac{1}{p}] + [x + \frac{1}{p}]} \Rightarrow [x - \frac{1}{p}] + [x + \frac{1}{p}] \geq 0 \Rightarrow [x + \frac{1}{p} + 1] + [x + \frac{1}{p}] \geq 0$
 $\Rightarrow [x + \frac{1}{p}] - 1 + [x + \frac{1}{p}] \geq 0 \Rightarrow 2[x + \frac{1}{p}] \geq 1 \Rightarrow [x + \frac{1}{p}] \geq \frac{1}{2} \Rightarrow x + \frac{1}{p} \geq 1 \Rightarrow x \geq \frac{1}{p}$
 $D_f = [\frac{1}{p}, +\infty)$ ✓

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ب) $y = \sqrt{[x - \frac{1}{p}] + [-x + \frac{1}{p}]} \Rightarrow [x - \frac{1}{p}] + [-x + \frac{1}{p}] \geq 0 \Rightarrow \begin{cases} a \in \mathbb{Z} \Rightarrow [a] + [-a] = 0 \\ a \notin \mathbb{Z} \Rightarrow [a] + [-a] = -1 \end{cases} \Rightarrow x - \frac{1}{p} \in \mathbb{Z}$
 $D_f = \{x \mid x = k + \frac{1}{p}, k \in \mathbb{Z}\}$ ✓

③

الف) $y = \frac{1}{\sqrt{2\sin^2 x - 1}} \Rightarrow 2\sin^2 x - 1 \neq 0 \Rightarrow 2\sin^2 x \neq 1 \Rightarrow \sin^2 x \neq \frac{1}{2} \Rightarrow \sin x \neq \pm \frac{1}{\sqrt{2}}$
 $\Rightarrow D_f = \emptyset$ $\sin x \neq \pm \frac{1}{\sqrt{2}} \Rightarrow D_f = \mathbb{R} - \{ \frac{k\pi}{4} + \frac{\pi}{4}, \frac{k\pi}{4} + \frac{3\pi}{4} \}$

ب) $y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \tan x \neq -1 \Rightarrow \frac{\sin x}{\cos x} \neq -1 \Rightarrow \sin x \neq -\cos x$
 $D_f = \mathbb{R} - \{ k\pi - \frac{\pi}{4}, k\pi + \frac{3\pi}{4} \}$ Cot, tan باید مرتب شود
 $D_f = \mathbb{R} - \{ \frac{k\pi}{4} - \frac{\pi}{4}, \frac{k\pi}{4} \}$

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الف) $y = \sqrt{2\sin x - 1} \Rightarrow 2\sin x - 1 \geq 0 \Rightarrow 2\sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{2}$
 $\frac{2k\pi + \frac{\pi}{6}}{2} \leq x \leq \frac{2k\pi + \frac{5\pi}{6}}{2} \Rightarrow D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$ ✓

④

ب) $y = \sqrt{1 - 2\cos x} \Rightarrow 1 - 2\cos x \geq 0 \Rightarrow 2\cos x \leq 1 \Rightarrow \cos x \leq \frac{1}{2}$

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$D_f = [2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}]$ ✓