

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

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ب) $y = \sqrt{\cos x - 1} \geq 0 \rightarrow \cos x \leq -1$ $D = [2k\pi]$

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الف) $\cos y = |x| - 3 \rightarrow -1 \leq |x| - 3 \leq 1 \rightarrow 2 \leq |x| \leq 4$ $D = [-4, -2] \cup [2, 4]$

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$\begin{array}{c} -3 & 0 \\ + & - & + \\ + & - & + \end{array}$

$x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow D = [-3, 0]$

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ب) $y = \arcsin(x^2 + 2x + 1) \rightarrow -1 \leq x^2 + 2x + 1 \leq 1$ $D = [-1, -2] \cup [0, 1]$

$\begin{array}{c} -2 & -1 \\ + & - & + \\ + & - & + \end{array}$

$D = (-\infty, -1] \cup [0, +\infty)$

الف) $y = \sqrt{2 - \log_2(x-2)} \geq 0 \rightarrow \log_2(x-2) \leq 2 \rightarrow \log_2(x-2) \leq 1 \rightarrow \log_2 x \leq 1$

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ب) $y = \log(x^3 - x) \rightarrow x(x^2 - 1) = x(x+1)(x-1) > 0$

$\begin{array}{c} -1 & 0 & 1 \\ - & + & - & + \\ - & + & - & + \end{array}$

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

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الف) $y = \frac{x}{x+1} \rightarrow x \neq -1$ $D = \mathbb{R}$

ب) $y = \frac{x}{x-1} \rightarrow x \neq 1$ $D = \mathbb{R} - \{0\}$

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ج) $y = \frac{x}{x-2} \rightarrow x \neq 2$ $D = \mathbb{R} - \{2\}$

د) $y = \frac{x}{x^2 - x} \rightarrow x \neq 0, 1 \rightarrow \log_2 x = 2$ $D = \mathbb{R} - \{\log_2 4\}$

الف) $y = (x+1)! \rightarrow x+1 \in \mathbb{N} (k = 0, 1, 2, \dots) \rightarrow x = \frac{k}{2} - 1$

$D = \{-\frac{1}{2}, \frac{1}{2}, \frac{3}{2}, \dots\}$ $D_y = \{n! \mid n = \frac{k-1}{2}, k \in \mathbb{N}\}$

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$\rightarrow x(k = 0, 1, 2, \dots)$

ب) $(\frac{x-2}{x-5})! \rightarrow \frac{x-2}{x-5} \in \mathbb{N} \rightarrow \frac{x-2}{x-5} = \frac{x-k}{x-5} \rightarrow x-2 = x-k \rightarrow x(1-k) = 2-k$

$D_y = \{n! \mid n = \frac{2-k}{1-k}, k \in \mathbb{N}\}$ $x = \frac{2-k}{1-k}$

$D = \{\frac{2}{1}, -\frac{1}{2}, \frac{1}{3}, \dots\}$

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$\begin{cases} k=0 \rightarrow x = \frac{2}{1} \\ k=1 \rightarrow x = -\frac{1}{2} \\ k=2 \rightarrow x = \frac{1}{3} \\ k=3 \rightarrow x = -\frac{1}{4} \end{cases}$

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الف) $\sqrt{\frac{x^2-4x}{x^2-x}} \geq 0 \rightarrow \frac{x(x-4)}{x(x^2-1)} \rightarrow \frac{-1}{-} \frac{0}{+} \frac{1}{+} \frac{1}{+}$ $D = (-1, 0) \cup [4, +\infty) - \{0\}$ 17, 16

ب) $\sqrt{\frac{x^5-4x^2}{x^2-x}} \geq 0 \rightarrow \frac{x^2(x^3-4)}{x(x^2-1)} \rightarrow \frac{-1}{+} \frac{0}{+} \frac{1}{+}$ $D = \mathbb{R} - \{1, 0, -1\}$ 1, 17, 8

الف) $y = \frac{x+1}{\sqrt{x+|x|}} \geq 0 \rightarrow D = (0, +\infty)$

✓ (2)

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

الف) $y = \sqrt{2-x} \geq 0 \rightarrow [x] \leq 2 \rightarrow D = (-\infty, 3)$

✓ (2)

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

الف) $y = \sqrt{[x-\frac{1}{2}] + [x+\frac{1}{2}]} \geq 0 \rightarrow D = [\frac{1}{2}, +\infty)$ 15 عمل نفوس
 $[n-\frac{1}{2}] + [n-\frac{1}{2}] + 1 \geq 0 \rightarrow 2[n-\frac{1}{2}] \geq -1 \rightarrow [n-\frac{1}{2}] \geq -\frac{1}{2} \rightarrow [n-\frac{1}{2}] \geq 0$
 $n \geq \frac{1}{2} \rightarrow D_y = [\frac{1}{2}, +\infty)$

ب) $\sqrt{[x-\frac{1}{2}] + [-x+\frac{1}{2}]} \geq 0$ همیشه مثبت می تواند باشد $n-\frac{1}{2} \in \mathbb{Z} \rightarrow n \in \mathbb{Z} + \frac{1}{2}$
 $D = (\frac{1}{2}, +\infty)$ $D_y = \{n | n = k + \frac{1}{2}, k \in \mathbb{Z}\}$

الف) $y = \frac{2}{\sin x - 1} \neq 0 \rightarrow \sin x \neq 1 \rightarrow D = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

✓ (2)

ب) $y = \frac{3}{2 \sin x - 1} \neq 0 \rightarrow \sin x \neq \frac{1}{2} \rightarrow \sin x \neq \frac{\sqrt{2}}{2}$ $D = \mathbb{R} - \{\frac{k\pi}{2} + \frac{\pi}{4}\}$