

۲. اولین عایق نوشتن

* چون رابطه ما به حالت های مطلوب منجر شود پس یک خط است:

$$a-2=0 \rightarrow a=2$$

$$f(x) = \sqrt{2x+b} \rightarrow 2x+b \geq 0 \rightarrow b \geq -2$$

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$$\Delta \leq 0 \rightarrow 4 - 4(2-m^2) \leq 0 \rightarrow 4 - 8 + 4m^2 \leq 0 \rightarrow 4m^2 - 4 \leq 0 \rightarrow m^2 - 1 \leq 0$$

$$m^2 \leq 1 \rightarrow -1 \leq m \leq 1 \rightarrow 1 - (-1) = 2$$

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$$① 4 - x^2 \geq 0 \rightarrow 4 \geq x^2 \rightarrow 2 \geq x \geq -2$$

$$② \text{ if } x \in \mathbb{Z} \rightarrow [x] + [-x] + 1 = 1 \rightarrow \checkmark$$

$$\text{if } x \in \mathbb{R} - \mathbb{Z} \rightarrow [x] + [-x] + 1 = 0 \rightarrow \text{no}$$

$$-2, -1, 0, 1, 2$$

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$$\text{الف) } x^3 + 3x^2 \geq 0 \rightarrow x^2(x+3) \rightarrow \begin{matrix} - & + & + \\ - & + & + \end{matrix} \quad D_f: [-3, +\infty)$$

$$\text{ب) } y = \sqrt{(x^2-1)(x^3-x^2)} \rightarrow \begin{matrix} x^2-1 \geq 0 \rightarrow x \geq 1 \text{ or } x \leq -1 \\ x^3-x^2 \geq 0 \rightarrow x \geq 0 \end{matrix}$$

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$$\begin{matrix} & * & * & * \\ -1 & 0 & 1 & 2 \\ + & - & - & + \end{matrix}$$

$$x^3 - 2x^2 = 0 \rightarrow x^2(x-2) = 0 \rightarrow x = 0, 2$$

$$D_f: (-\infty, -1] \cup \{0\} \cup [2, +\infty)$$

$$\text{ان) } \sqrt{|x-2|} - 3 \geq 0 \rightarrow |x-2| \geq 9 \rightarrow x-2 \geq 3 \rightarrow x \geq 5$$

$$x-2 \leq -3 \rightarrow x \leq -1$$

$$D_f: (-\infty, -1] \cup [5, +\infty)$$

$$\text{ب) } \sqrt{4-|2-x|} \rightarrow 4 - |2-x| \geq 0 \rightarrow 4 \geq |2-x| \rightarrow 4 \geq 2-x \geq -4 \rightarrow 2 \geq -x \geq -6$$

$$-2 \leq x \leq 4$$

$$D_f: [-2, 4]$$

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الف) $\sqrt{1-x|x|} \rightarrow |x| \geq 0 \rightarrow |x| \geq |x| \rightarrow x \geq 0 \rightarrow 1 \geq x^2 \rightarrow 1 \geq x \geq -1$
 $D_f: (-\infty, 1]$ ✓

ب) $\frac{1}{\sqrt{3-|x-2|}-1}$
 $3-|x-2| \geq 0 \rightarrow 3 \geq |x-2| \rightarrow 3 \geq x-2 \geq -3 \rightarrow 5 \geq x \geq -1$
 $\sqrt{3-|x-2|}-1 \neq 0 \rightarrow \sqrt{3-|x-2|}+1 \rightarrow 3-|x-2| \neq 1$
 $|x-2| \neq 2 \rightarrow x-2 \neq \pm 2 \rightarrow x \neq 4 \rightarrow x \neq 0$
 $D_f: [2, 5] - \{0, 4\}$

الف) $y = \frac{\sin^2 x - 1}{\cos x} \rightarrow \cos x \neq 0 \rightarrow D_f: \mathbb{R} - \{k\pi + \frac{\pi}{2}\}$ ✓

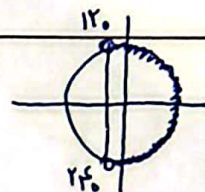
ب) $\frac{\cos x}{y(\cos x - 1)}$
 $y(\cos x - 1) \neq 0 \rightarrow \cos x \neq \frac{1}{y} \rightarrow D_f: \mathbb{R} - \{y k\pi + \frac{\pi}{y}, y k\pi - \frac{\pi}{y}\}$

الف) $\frac{x+3}{|2x+1|-|x+2|}$
 $|2x+1|-|x+2| \neq 0 \rightarrow |2x+1| = |x+2| \rightarrow (2x+1)^2 = (x+2)^2$
 $4x^2 + 4x + 1 = x^2 + 4x + 4 \rightarrow 3x^2 - 3 = 0 \rightarrow x = \pm 1$
 $D_f: \mathbb{R} - \{1, -1\}$

ب) $\sqrt{|2x+1|-|x+2|}$
 $|2x+1|-|x+2| \geq 0 \rightarrow |2x+1| \geq |x+2| \rightarrow (2x+1)^2 \geq (x+2)^2$
 $3x^2 - 3 \geq 0 \rightarrow x \leq -1 \text{ or } x \geq 1$
 $D_f: (-\infty, -1] \cup [1, +\infty)$ ✓

① $2x-1 > 0 \rightarrow 2x > 1 \rightarrow x > \frac{1}{2}$
 ② $\log_2^{2x-1} > 0 \rightarrow 2x-1 > 1 \rightarrow 2x > 2 \rightarrow x > 1$
 ③ $\log_{\frac{1}{2}}^{\log_2^{2x-1}} \geq 0 \rightarrow \log_2^{2x-1} \leq 1 \rightarrow 2x-1 \leq 2 \rightarrow 2x \leq 3 \rightarrow x \leq \frac{3}{2}$
 $D_f: (1, \frac{3}{2}]$ ✓

الف) $\log(y \cos x)$
 $y \cos x > 0 \rightarrow \cos x > \frac{-1}{y}$
 $D_f: \mathbb{R} - [y k\pi + \frac{\pi}{y}, y k\pi + \frac{5\pi}{y}]$



ب) $\sqrt{\log \frac{n-1}{n+1}}$
 ① $\frac{n-1}{n+1} > 0 \rightarrow \frac{-1}{+} - \frac{1}{+} \rightarrow (-\infty, -1) \cup (1, +\infty)$

② $\log \frac{n-1}{n+1} \geq 0 \rightarrow \frac{n-1}{n+1} \geq 1 \rightarrow \frac{n-1-n-1}{n+1} \geq 0 \rightarrow \frac{-2}{n+1} \geq 0 \rightarrow \frac{-1}{+} - \frac{1}{+}$
 ① ② $\rightarrow D_f: (-\infty, -1) \cup (1, +\infty)$