

۱۷/۵

$$f(x) = \sqrt{(a-2)x^2 + ax + b} \Rightarrow \begin{cases} (a-2)x^2 + ax + b \geq 0 \xrightarrow{x=2} 4a - 11 + 2a + b \geq 0 \Rightarrow b \geq 11 - 4a \\ a-2 > 0 \Rightarrow a > 2 \end{cases}$$

$$D_f = [2, \infty)$$

$$a=3 \Rightarrow b = 11 - 4(3) \Rightarrow b = -1$$

$$a=2 \Rightarrow b < 11 - 4(2) \Rightarrow b < -4$$

$$b \in (-\infty, -4)$$

باید یک خط با شیب + باشد!

۱/۵

$$f(x) = \sqrt{x^2 + 2x + 2 - m^2} \Rightarrow \begin{cases} x^2 + 2x + 2 - m^2 \geq 0 \\ \Delta \leq 0 \Rightarrow 4 - 4(2 - m^2) \leq 0 \Rightarrow 4m^2 - 4 \leq 0 \Rightarrow m^2 \leq 1 \Rightarrow -1 \leq m \leq 1 \\ a > 0 \end{cases}$$

$$D_f = \mathbb{R}$$

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$$f(x) = \frac{\sqrt{4-x^2}}{[x] + [x] + 1} \Rightarrow \begin{cases} 4-x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow -2 \leq x \leq 2 \\ [x] + [-x] + 1 \neq 0 \Rightarrow [x] + [-x] \neq -1 \Rightarrow x \notin \mathbb{Z} \end{cases}$$

$$D_f = [-2, 2] \Rightarrow D_f = \{-2, -1, 0, 1, 2\} \Rightarrow n = 5$$

عدد صحیح در دامنه قرار دارد.

۳

$$y = \sqrt{x^2 + 3x^2} \Rightarrow x^2 + 3x^2 \geq 0 \Rightarrow x^2(1+3) \geq 0 \Rightarrow x^2 \geq 0 \Rightarrow x \in \mathbb{R} \Rightarrow D_f = [-2, \infty)$$

۲

$$y = \sqrt{\frac{(x^2-1)(x^2-3x^2)}{x^2-1}} \Rightarrow \begin{cases} (x^2-1)(x^2-3x^2) \geq 0 \Rightarrow x^2(x-1)(x+1)(x-3) \geq 0 \\ x^2-1 > 0 \Rightarrow (x-1)(x+1) > 0 \end{cases}$$

$$D_f = (-\infty, -1] \cup \{0\} \cup [3, \infty)$$

$$\begin{array}{c} -1 & 0 & 3 \\ + & - & + \\ \hline \end{array}$$

۴

$$y = \sqrt{|x-2| - 3} \Rightarrow |x-2| - 3 \geq 0 \Rightarrow |x-2| \geq 3 \Rightarrow \begin{cases} x-2 \geq 3 \Rightarrow x \geq 5 \\ x-2 \leq -3 \Rightarrow x \leq -1 \end{cases}$$

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

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$$y = \sqrt{4 - |2-x|} \Rightarrow 4 - |2-x| \geq 0 \Rightarrow |2-x| \leq 4 \Rightarrow \begin{cases} 2-x \leq 4 \Rightarrow x \geq -2 \\ 2-x \geq -4 \Rightarrow x \leq 6 \end{cases}$$

$$D_f = [-2, 6]$$

صورت سوال را اشتباه نرست! $\sqrt{3-\ln-a} \geq 0 \Rightarrow 3-\ln-a \geq 0 \Rightarrow \ln-a \leq 3 \Rightarrow -a \leq 3+\ln \Rightarrow a \geq -3-\ln$

الف) $y = \sqrt{1-x|x|} \Rightarrow 1-x|x| \geq 0 \Rightarrow x|x| \leq 1$
 $D_f: (-\infty, 1]$
 $\oplus \rightarrow 1|1| = 1 \checkmark \rightarrow 1|1| \leq 1$
 $\ominus \rightarrow -1|1| = -1 \checkmark \rightarrow -1|1| \leq 1$
 $\odot \rightarrow 0|0| = 0 \checkmark \rightarrow 0|0| \leq 1$

ب) $y = \frac{1}{\sqrt{3-\ln-a}-1} \Rightarrow 3-\ln-a > 0 \Rightarrow \ln-a < 3 \Rightarrow -\ln-a < 3 \Rightarrow \ln-a < 3 \Rightarrow a < 3+\ln$
 $D_f: (3+\ln, \infty)$

الف) $y = \frac{\sin x - 1}{\cos x} \Rightarrow \cos x \neq 0 \Rightarrow x = \frac{\pi}{2}, \frac{3\pi}{2} \Rightarrow x \neq \frac{\pi}{2} + k\pi$
 $D_f: \mathbb{R} - \{\frac{\pi}{2} + k\pi | k \in \mathbb{Z}\}$

ب) $y = \frac{\cos x}{x \cos x - 1} \Rightarrow x \cos x - 1 \neq 0 \Rightarrow \cos x \neq \frac{1}{x} \Rightarrow x \neq \frac{\pi}{2}, \frac{3\pi}{2} \Rightarrow x \neq \frac{\pi}{2} + k\pi$
 $D_f: \mathbb{R} - \{\frac{\pi}{2} + k\pi | k \in \mathbb{Z}\}$

الف) $y = \frac{x^3}{|x+1|-|x+3|} \Rightarrow |x+1|-|x+3| \neq 0 \Rightarrow |x+1| \neq |x+3| \xrightarrow{\text{فصل کنیم}} (x+1)^2 \neq (x+3)^2$
 $\Rightarrow x^2 + 2x + 1 \neq x^2 + 6x + 9 \Rightarrow 2x + 1 \neq 6x + 9 \Rightarrow -4x \neq 8 \Rightarrow x \neq -2$
 $D_f: \mathbb{R} - \{-2\}$
 ب) $y = \sqrt{|x+1|-|x+3|} \Rightarrow |x+1|-|x+3| \geq 0 \Rightarrow |x+1| \geq |x+3| \xrightarrow{\text{فصل کنیم}} (x+1)^2 \geq (x+3)^2$
 $\Rightarrow x^2 + 2x + 1 \geq x^2 + 6x + 9 \Rightarrow -4x \geq 8 \Rightarrow x \leq -2$
 $D_f: (-\infty, -2] \cup [2, \infty)$

$f(x) = \sqrt{\log_{10} \log_a^{(x-1)}}$
 $\log_{10} \log_a^{(x-1)} \geq 0 \Rightarrow \begin{cases} \log_a^{(x-1)} \geq 1 \Rightarrow x-1 \geq 1 \Rightarrow x \geq 2 \\ \log_a^{(x-1)} \leq 0 \Rightarrow 0 < \log_a^{(x-1)} \leq 1 \Rightarrow \begin{cases} \log_a^{(x-1)} > 0 \Rightarrow x-1 > 1 \Rightarrow x > 2 \\ \log_a^{(x-1)} \leq 1 \Rightarrow x-1 \leq a \Rightarrow x \leq a+1 \end{cases} \end{cases}$
 $\Rightarrow D_f: [2, a+1]$
 تازین زهره سفید

الف) $y = \log(x \cos x + 1) \Rightarrow x \cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{x}$
 $D_f: (x \cos x - \frac{1}{x}, x \cos x + \frac{1}{x})$

ب) $y = \sqrt{\log \frac{x-1}{x+1}} \Rightarrow \log \frac{x-1}{x+1} \geq 0 \Rightarrow \frac{x-1}{x+1} \geq 1 \Rightarrow \frac{x-1}{x+1} - 1 \geq 0 \Rightarrow \frac{x-1-x-1}{x+1} \geq 0 \Rightarrow \frac{-2}{x+1} \geq 0$
 $\Rightarrow x+1 < 0 \Rightarrow x < -1$
 $D_f: (-\infty, -1)$

(۱) چون دامنه تک بازه است پس عبارت نمی تواند یک سهم باشد و باید یک خط باشد!

$$a-2=0 \rightarrow a=2 \rightarrow f(x)=\sqrt{2x+b} \quad Df=[2,+\infty) \rightarrow f(2)+b=0 \rightarrow \boxed{b=-4}$$

ب-۴ $3-|x-5| \geq 0 \rightarrow |x-5| \leq 3 \rightarrow -3 \leq x-5 \leq 3 \rightarrow 2 \leq x \leq 8$

$$\sqrt{3-|x-5|} - 1 \neq 0 \rightarrow \sqrt{3-|x-5|} \neq 1 \rightarrow 3-|x-5| \neq 1 \rightarrow |x-5| \neq 2 \rightarrow x \neq 7, 3$$

$$Df = [2, 8] - \{3, 7\} = [2, 3) \cup (3, 7) \cup (7, 8]$$
