

① $f(x) = \sqrt{(a-x)x^2 + ax + b}$ $D_f: [w + \infty) \rightarrow$ از آنجایی که دامنه از ابتدا عدد به بعد را نشان می دهد که این عدد ویرانه می باشد و در ازای w مساوی صفر می باشد
 $a-x=0 \rightarrow a=x$
 $vx + b \geq 0 \xrightarrow{x=w} v(w) + b = 0 \rightarrow b = -4$

② $f(x) = \sqrt{x^2 + vx + v \cdot w^2}$ $D_f: \mathbb{R} \rightarrow \Delta \{0\} \rightarrow b^2 - 4ac \geq 0 \rightarrow v^2 - 4(1 \cdot w^2) \geq 0$
 $1 - v + w^2 \geq 0 \rightarrow w^2 - 1 \geq 0 \xrightarrow{\begin{matrix} +1 & -1 \\ -1 & +1 \end{matrix}} w \geq 1 \text{ یا } w \leq -1$ $+1 - (-1) = 2$

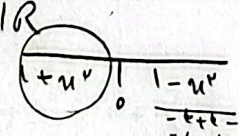
③ $\pm$ $x - x^2 \geq 0 \rightarrow \frac{-x \pm x^2}{-1 \pm x} \rightarrow [-x, x] \quad \text{II)} [x] + [-x] + 1 \neq 0 \rightarrow [x] + [-x] = \begin{cases} x \in \mathbb{Z} \rightarrow 0 \\ x \notin \mathbb{Z} \rightarrow -1 \end{cases}$
 $\text{I} \cap \text{II} \rightarrow D_f: \{ \pm x, \pm 1, 0 \} \rightarrow$ اینها همگی عدد است!

④ الف) $y = \sqrt{x^3 + vx^2}$ $\rightarrow x^2 + vx \geq 0 \rightarrow x^2(x + v) \geq 0 \xrightarrow{-1 \pm 1 \pm} D_f: [-w + \infty)$

ب) $y = \sqrt{\frac{(x^2-1)(x^3-vx^2)}{x^3-1}}$ $\frac{(x^2-1)(x^3-vx^2)}{x^3-1} \geq 0 \rightarrow \frac{(x+1)(x-1)(x^2)(x-v)}{x^3-1}$
 $\begin{matrix} + & - & - & + \\ -1 & 0 & 1 & v \end{matrix} \quad (-\infty -1] \cup [w + \infty) \cup \{0\}$

⑤ الف) $y = \sqrt{|x+1-x|} \rightarrow |x-1-x| \geq 0 \rightarrow |x-1| \geq x \rightarrow x-1 \geq x \quad \text{یا} \quad x-1 \leq -x$
 $D_f: (-\infty -1] \cup [0 + \infty)$

ب) $y = \sqrt{x-1-x} \rightarrow x-1-x \geq 0 \rightarrow x \geq |x-1| \rightarrow x-1 \geq x \quad \text{یا} \quad x-1 \leq -x$
 $D_f: [-1, 1]$

⑥ الف) $y = \sqrt{1-x|x|} \rightarrow 1-x|x| \geq 0$  $D_f: (-\infty 1]$

ب) $y = \frac{1}{\sqrt{w-|x-b|}-1}$ $\rightarrow w-|x-b| \geq 0 \rightarrow w \geq |x-b|$ $x-b \geq w \quad \text{یا} \quad x-b \leq -w$
 $\sqrt{w-|x-b|} \neq 1 \rightarrow w-|x-b| \neq 1 \rightarrow |x-b| \neq w-1 \rightarrow x-b \neq \pm(w-1) \rightarrow x \neq w-1 \pm b$
 $[1, 1] - \{w-1, w-1\}$

⑦ الف) $y = \frac{\sin^2 x - 1}{\cos x} \rightarrow \cos \neq 0 \quad D_f: \mathbb{R} - \{k\pi + \frac{\pi}{2}\}$

ب) $y = \frac{\cos x}{x \cos x - 1}$ $\rightarrow x \cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{x} \quad x \neq \frac{1}{\cos x}$

$D_f: \mathbb{R} - \{x | k\pi + \frac{\pi}{2}, x | k\pi - \frac{\pi}{2}\}$

① ا) $y = \frac{u+v}{|vu+1| - |u+v|} \rightarrow |vu+1| - |u+v| \neq 0 \rightarrow |vu+1| \neq |u+v|$ موجب
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$(vu+1)^2 \neq (u+v)^2 \rightarrow \pm vu^2 + 1 \pm 2u \neq u^2 + 1 + 2u \rightarrow vu^2 - u^2 - 2u - 1 \neq 0$

$u^2 - 2u - 1 \neq 0 \rightarrow (u-2)(u+1) \neq 0 \rightarrow u \neq \frac{-2}{1} \text{ و } \frac{1}{1} \rightarrow \text{دفعه } R = \left\{ \frac{1}{2}, -\frac{2}{1} \right\}$

ب) $y = \sqrt{|vu+1| - |u+v|} \rightarrow |vu+1| - |u+v| \geq 0 \rightarrow |vu+1| \geq |u+v|$ موجب

$(vu+1)^2 \geq (u+v)^2 \rightarrow \pm vu^2 + \pm 2u + 1 \geq u^2 + 2u + 1 \rightarrow vu^2 - u^2 - 1 \geq 0$

$\rightarrow u^2 - 2u - 1 \geq 0 \rightarrow (u-2)(u+1) \geq 0 \rightarrow \begin{cases} \text{① } \frac{1}{2} \leq u \\ \text{② } u \leq -\frac{1}{2} \end{cases} \rightarrow \frac{1}{2} - \frac{1}{2} + \frac{1}{2}$

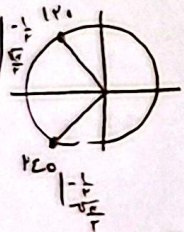
دفعه: $(-\infty, -\frac{1}{2}] \cup [\frac{1}{2}, \infty)$

② $f(u) = \sqrt{\log_{0.5}^{(vu-1)}}$ موجب

$vu-1 > 1 \rightarrow u > 1 \rightarrow \text{III) } \log_{0.5}^{(vu-1)} < 0 \rightarrow \log_{0.5}^{(vu-1)} < 1 \rightarrow 0 < vu-1 \rightarrow u < \frac{1}{v}$

$\text{I} \cap \text{II} \cap \text{III} \rightarrow (1, \frac{1}{v}]$

③ ا) $y = \log(v \cos + 1) \rightarrow v \cos + 1 > 0 \rightarrow v \cos > -1 \rightarrow \cos > -\frac{1}{v}$



دفعه: $(vk\pi - \frac{\pi}{v}, vk\pi + \frac{\pi}{v})$

ب) $y = \sqrt{\log_{\frac{u-1}{u+1}}}$ موجب

II) $\log_{\frac{u-1}{u+1}} > 0 \rightarrow \frac{u-1}{u+1} > 1 \rightarrow \frac{u-1-(u+1)}{u+1} > 0 \rightarrow \frac{-1}{u+1} > 0 \rightarrow (-\infty, -1)$

$\text{I} \cap \text{II} \rightarrow \text{دفعه } (-\infty, -1)$