

1) $f(x) = \sqrt{(a-x)x^2 + ax + b}$ $D_f: [x^2 + \infty) \rightarrow$ از آنجایی که دامنه از ابتدا عدد به بعد را نشان می دهد که این عدد ویرگول و خط است و در ازای x مساوی صفر است 8
 $a-x=0 \rightarrow a=x$
 $ax+b \geq 0 \xrightarrow{x=a} a^2+b=0 \rightarrow b=-a$

2) $f(x) = \sqrt{x^2 + x + x^2}$ $D_f: \mathbb{R} \rightarrow \Delta \{0\} \rightarrow b^2 - 4ac \{0\} \rightarrow \Delta = 1 - 4(1+1) \{0\}$
 $1 - 4 + 4 \{0\} \rightarrow x^2 - 1 \{0\}$
 $\frac{1}{-1} \quad \frac{1}{+1}$ $\max = +1$ $\min = -1$ $+1 - (-1) = 2$

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

4) الف) $y = \sqrt{x^3 + x^2}$ $\rightarrow x^2 + x^3 \geq 0 \rightarrow x^2(x+1) \geq 0$ $\frac{-1}{-1} \quad \frac{1}{0}$ $D_f: [-1, +\infty)$

ب) $y = \sqrt{\frac{(x^2-1)(x^3-x^2)}{x^3-1}}$ $\frac{(x^2-1)(x^3-x^2)}{x^3-1} \geq 0 \rightarrow \frac{(x+1)(x-1)(x^2)(x-x)}{x^3-1}$
 $\frac{+}{-1} \quad \frac{-}{0} \quad \frac{-}{1} \quad \frac{+}{x}$ $(-\infty, -1] \cup [x, +\infty) \cup \{0\}$

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

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

4) الف) $y = \sqrt{1-x|x|} \rightarrow 1-x|x| \geq 0$ $\frac{1}{1+x^2}$ $D_f: (-\infty, 1]$

ب) $y = \frac{1}{\sqrt{x-1-x-1}}$ $x-1-x-1 \geq 0 \rightarrow x \geq |x-1|$ $x-1 \leq x$ یا $x-1 \geq -x$
 $\sqrt{x-1-x-1} \neq 1 \rightarrow x-1-x-1 \neq 1 \rightarrow |x-1| \neq 2 \rightarrow x-1 \neq \pm 2 \rightarrow x \neq 3, -1$
 $[1, 3) \cup (-1, -3)$

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

ب) $y = \frac{\cos x}{x \cos x - 1} \rightarrow x \cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{x}$ $x \neq \frac{1}{\cos x}$
 $D_f: \mathbb{R} - \{x | x \cos x = 1\}$

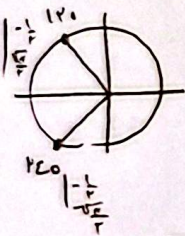
ا) $y = \frac{x+1}{|x+1| - |x+1|} \rightarrow |x+1| - |x+1| \neq 0 \rightarrow |x+1| \neq |x+1|$ ملاحظة: لا يمكن

$(x+1)^2 \neq (x+1)^2 \rightarrow x^2+1+x \neq x^2+1+x \rightarrow x^2-x-1 \neq 0$
 $x^2-x-1 \neq 0 \rightarrow (x-2)(x+2) \neq 0 \rightarrow x \neq \frac{-2}{1} \rightarrow \text{Df: } \mathbb{R} - \left\{ \frac{-2}{1}, -\frac{2}{2} \right\}$

ب) $y = \sqrt{|x+1| - |x+1|} \rightarrow |x+1| - |x+1| \geq 0 \rightarrow |x+1| \geq |x+1|$ ملاحظة: لا يمكن
 $(x+1)^2 \geq (x+1)^2 \rightarrow x^2+1+x \geq x^2+1+x \rightarrow x^2-x-1 \geq 0$
 $\rightarrow x^2-x-1 \geq 0 \rightarrow (x-2)(x+2) \geq 0 \rightarrow \begin{cases} \text{I} \frac{-2}{1} = 2 \\ \text{II} \frac{-2}{1} = -2 \end{cases} \rightarrow \text{Df: } (-\infty, -2] \cup [2, \infty)$

ج) $f(x) = \sqrt{\log_{0.5}^{(x-1)}}$ $\rightarrow x-1 \geq 0 \rightarrow x \geq 1 \rightarrow x \geq \frac{1}{2} \pi$ ملاحظة: لا يمكن
 $x-1 \geq 0 \rightarrow x \geq 1$ ملاحظة: لا يمكن
 $\text{I} \cap \text{II} \cap \text{III} \rightarrow (1, \infty)$

د) ا) $y = \log(x \cos + 1) \rightarrow x \cos + 1 \geq 0 \rightarrow x \cos \geq -1 \rightarrow \cos \geq -\frac{1}{x}$



Df: $\left(x \cos - \frac{1}{x} \geq 0 \text{ و } x \cos + \frac{1}{x} \geq 0 \right)$

ب) $y = \sqrt{\log_{0.5} \frac{x-1}{x+1}}$ $\rightarrow \frac{x-1}{x+1} \geq 0$ ملاحظة: لا يمكن
 $\frac{x-1}{x+1} \geq 0 \rightarrow x \geq 1 \rightarrow \frac{x-1-(x+1)}{x+1} \geq 0 \rightarrow \frac{-2}{x+1} \geq 0 \rightarrow (-\infty, -1) \cup (1, \infty)$

ج) $\log_{0.5} \frac{x-1}{x+1} \geq 0 \rightarrow \frac{x-1}{x+1} \geq 1 \rightarrow \frac{x-1-(x+1)}{x+1} \geq 0 \rightarrow \frac{-2}{x+1} \geq 0 \rightarrow (-\infty, -1)$
 $\text{I} \cap \text{II} \rightarrow \text{Df: } (-\infty, -1)$