

الف) $y = \sqrt{4 - \sqrt{2 - a_1}}$ $\xrightarrow{\text{نیز باید } 2 - a_1 \geq 0}$ $\begin{cases} \sqrt{2 - a_1} \rightarrow 2 - a_1 \geq 0 \rightarrow a_1 \leq 2 \\ \sqrt{4 - \sqrt{2 - a_1}} \rightarrow 4 - \sqrt{2 - a_1} \geq 0 \rightarrow \sqrt{2 - a_1} \leq 4 \rightarrow 2 - a_1 \leq 16 \rightarrow -14 \leq a_1 \end{cases}$
 $\Rightarrow D_f = [-14, 2]$

ب) $y = \sqrt{3 - \sqrt{a_1 - 2}}$ $\xrightarrow{\text{نیز باید } a_1 - 2 \geq 0}$ $\begin{cases} \sqrt{a_1 - 2} \rightarrow a_1 - 2 \geq 0 \rightarrow a_1 \geq 2 \\ \sqrt{3 - \sqrt{a_1 - 2}} \rightarrow 3 - \sqrt{a_1 - 2} \geq 0 \rightarrow \sqrt{a_1 - 2} \leq 3 \rightarrow a_1 - 2 \leq 9 \rightarrow a_1 \leq 11 \end{cases}$
 $\Rightarrow D_f = [2, 11]$

الف) $y = \sqrt{4 - 2a_1^2}$ $\xrightarrow{\text{نیز باید } 4 - 2a_1^2 \geq 0}$ $4 - 2a_1^2 \geq 0 \rightarrow 2(2 - a_1^2) \geq 0 \rightarrow 2 - a_1^2 \geq 0 \rightarrow a_1^2 \leq 2 \Rightarrow -\sqrt{2} \leq a_1 \leq \sqrt{2}$
 $\Rightarrow D_f = [-\sqrt{2}, \sqrt{2}]$

ب) $y = \sqrt{3|a_1| - 9}$ $\xrightarrow{\text{نیز باید } 3|a_1| - 9 \geq 0}$ $3|a_1| - 9 \geq 0 \rightarrow 3(|a_1| - 3) \geq 0 \xrightarrow{\div 3} |a_1| - 3 \geq 0 \rightarrow |a_1| \geq 3 \Rightarrow \begin{cases} a_1 \geq 3 \\ a_1 \leq -3 \end{cases}$
 $\xrightarrow{\text{اجتماع بازه}} D_f = (-\infty, -3] \cup [3, +\infty)$

الف) $y = \sqrt[3]{\frac{|a_1| + 1}{|a_1| - 3}}$ $\xrightarrow{\text{نیز باید } \frac{|a_1| + 1}{|a_1| - 3} \neq 0}$ $|a_1| - 3 \neq 0 \rightarrow |a_1| \neq 3 \Rightarrow a_1 \neq \pm 3$
 $\Rightarrow D_f = \mathbb{R} - \{-3, 3\}$

ب) $y = \sqrt[3]{\frac{\sqrt{a_1} + 1}{\sqrt{a_1} - 3}}$ $\xrightarrow{\text{نیز باید } \frac{\sqrt{a_1} + 1}{\sqrt{a_1} - 3} \neq 0}$ $\begin{cases} \sqrt{a_1} \rightarrow a_1 \geq 0 \\ \sqrt{a_1} - 3 \neq 0 \rightarrow \sqrt{a_1} \neq 3 \rightarrow a_1 \neq 9 \end{cases}$
 $\Rightarrow D_f = [0, +\infty) - \{9\}$

الف) $y = \frac{\sqrt{3 - |a_1|}}{|a_1| + 2}$ $\xrightarrow{\text{نیز باید } 3 - |a_1| \geq 0}$ $3 - |a_1| \geq 0 \rightarrow |a_1| \leq 3 \Rightarrow -3 \leq a_1 \leq 3$
 $\Rightarrow D_f = [-3, 3]$

ب) $y = \frac{\sqrt{4 - a_1^2}}{|a_1| - 1}$ $\xrightarrow{\text{نیز باید } 4 - a_1^2 \geq 0}$ $4 - a_1^2 \geq 0 \rightarrow 2 \geq |a_1| \rightarrow -2 \leq a_1 \leq 2$
 $\Rightarrow D_f = [-2, 2] - \{-1, 1\}$

الف) $y = \frac{a_1 + 1}{\sqrt{a_1 + 1}}$ $\xrightarrow{\text{نیز باید } a_1 + 1 \geq 0}$ $a_1 + 1 \geq 0 \rightarrow a_1 \geq -1$
 $\Rightarrow D_f = \mathbb{R}^+ = (0, +\infty)$

ب) $y = \frac{1}{\sqrt{|a_1|}}$ $\xrightarrow{\text{نیز باید } |a_1| > 0}$ $|a_1| > 0 \Rightarrow a_1 \neq 0$
 $\Rightarrow D_f = \mathbb{R}^+ = (0, +\infty)$

