

الف) $y = \log \frac{x^2 - 4x + 3}{x - 3} \rightarrow \frac{(x+1)(x-1)}{(x-3)} > 0$

$x+1 > 0 \rightarrow x > -1$
 $x-1 > 0 \rightarrow x > 1$
 $x-3 > 0 \rightarrow x > 3$

$D_f = (-1, 3)$

ب) $y = \log \frac{x+1}{x+5}$

$\frac{x+1}{x+5} > 0 \rightarrow x > -1$
 $x+5 > 0 \rightarrow x > -5$
 $x+5 \neq 1 \rightarrow x \neq -4$

$D_f = (-5, -4) \cup (-1, \infty)$

الف) $y = \sqrt{3 - \log_2^{(n-1)}}$

$x-2 > 0 \rightarrow x > 2$
 $3 - \log_2^{(x-2)} \geq 0 \rightarrow \log_2^{(x-2)} \leq 3 \rightarrow x-2 \leq 2^3 \rightarrow x \leq 10$

$D_f = [2, 10]$

ب) $y = \log(2 \log_2^n - 1)$

$x > 0$
 $2 \log_2^n - 1 > 0 \rightarrow 2 \log_2^n > 1$
 $\log_2^n > \frac{1}{2} \rightarrow x > 2^{\frac{1}{2}} \rightarrow x > \sqrt{2}$

$D_f = (\sqrt{2}, \infty)$

الف) $y = \frac{x}{x^2 + 1} \rightarrow x^2 + 1 \neq 0$

$x^2 \neq -1$
 معماره برقرار است!

$D_f = \mathbb{R}$

ب) $y = \frac{x}{x^2 - 1} \rightarrow x^2 - 1 \neq 0$

$x^2 \neq 1 \rightarrow x \neq \pm 1$

$D_f = \mathbb{R} - \{1, -1\}$

ج) $y = \frac{x}{x^2 - 2} \rightarrow x^2 - 2 \neq 0$

$x^2 \neq 2 \rightarrow x \neq \pm \sqrt{2}$
 $\hookrightarrow x \neq \log_2^2$

$D_f = \mathbb{R} - \{\log_2^2\}$

د) $y = \frac{x}{x^2 - 3} \rightarrow x^2 - 3 \neq 0 \rightarrow x \neq \pm \sqrt{3}$

$x \neq \log_2^3$

$D_f = \mathbb{R} - \{\log_2^3\}$

الف) $y = (x+1)!$

$x+1 \in \mathbb{N} \rightarrow x \in -1 + \mathbb{N} \rightarrow x \in \frac{1}{k} \mathbb{N}$

$D_f = \{x \mid x = \frac{1}{k} k, k \in \mathbb{N}\}$

ب) $y = \left(\frac{x-1}{x-5}\right)!$

$\frac{x-1}{x-5} \in \mathbb{N} \rightarrow x-1 = (x-5)k$
 $x-1 = xk - 5k$
 $x = \frac{-5k + 1}{1-k}$

آواحاتی - دایره هم - تکلیف شما و 5

الف) $y = \frac{\sin x - 2}{2 \cos x + 1}$

$2 \cos x + 1 \neq 0$

$2 \cos x \neq -1$

$\cos x \neq -\frac{1}{2}$

$D_f = \mathbb{R} - \left\{ 2k\pi - \frac{\pi}{3}, 2k\pi + \frac{2\pi}{3} \right\}$

ب) $y = \frac{\sin x + 3}{\cos x - 1}$

$\cos x - 1 \neq 0$

$\cos x \neq 1$

$D_f = \mathbb{R} - \{ 2k\pi \}$

سوال 2

الف) $y = \frac{2 \sin x + 1}{\tan x + 1}$

$\tan x + 1 \neq 0$

$\tan x \neq -1$

$x \neq (k\pi - \frac{\pi}{4})$

$\tan = \frac{\sin}{\cos} \rightarrow \cos x \neq 0 \rightarrow x \neq (k\pi + \frac{\pi}{2})$

$D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2}, k\pi - \frac{\pi}{4} \right\}$

ب) $y = \frac{\cos x + 1}{\cot x - 1}$

$\cot x - 1 \neq 0$

$\cot x \neq 1$

$x \neq \{ k\pi + \frac{\pi}{4} \}$

$\cot = \frac{\cos}{\sin} \rightarrow \sin x \neq 0 \rightarrow x \neq \{ k\pi \}$

$D_f = \mathbb{R} - \{ k\pi, k\pi + \frac{\pi}{4} \}$

الف) $\sin y = x^2 - 2$

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

$-1 \leq \sin y \leq 1$

$-\sqrt{3} \leq x \leq \sqrt{3}$

$x^2 - 2 \geq -1 \rightarrow x^2 \geq 1 \rightarrow x \leq -1 \vee x \geq 1$

$D_f = (-1, 1)$

ب) $y = \arccos(\sqrt{x-3})$

$D_f = [3, 14]$

$\sqrt{x} \geq 0 \rightarrow x \geq 0$

$-1 \leq \sqrt{x-3} \leq 1 \rightarrow 2 \leq \sqrt{x} \leq 4 \rightarrow 4 \leq x \leq 16$

سوال 3

الف) $\cos y = |x| - 3$

$-1 \leq \cos y \leq 1$

$D_f = (-3, -2] \cup [2, 3]$

$|x| - 3 \geq -1 \rightarrow |x| \geq 2 \rightarrow x \leq -2 \vee x \geq 2$

$|x| - 3 \leq 1 \rightarrow |x| \leq 4 \rightarrow -4 \leq x \leq 4$

ب) $y = \arcsin(x^2 + 3x + 1)$

$D_f = [-3, -2] \cup [-1, 0]$

$-1 \leq x^2 + 3x + 1 \leq 1$

$0 \leq x^2 + 3x + 1 \rightarrow 0 \leq (x+1)(x+2) \rightarrow \frac{-2}{+1-1} \rightarrow \frac{-1}{+1-1} \rightarrow [-1, \infty), (-\infty, -2]$

$x^2 + 3x + 1 \leq 1$

$x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow \frac{-3}{+1-1} \rightarrow \frac{0}{+1-1} \rightarrow [-3, 0]$

سوال 4

الف) $y = \log_{x-3} 2x$

$2x > 0 \rightarrow x > 0$

$x-3 > 0 \rightarrow x > 3$

$x-3 \neq 1 \rightarrow x \neq 4$

$D_f = (3, \infty) - \{4\}$

ب) $y = \log_{x+3} x^2 - 1$

$x^2 - 1 > 0 \rightarrow x^2 > 1 \rightarrow x > 1 \vee x < -1$

$x+3 > 0 \rightarrow x > -3$

$x+3 \neq 1 \rightarrow x \neq -2$

$D_f = (-3, 1) - \{-2\}$

سوال 5

الف) $y = \log_3 x^2 - 4$

$x^2 - 4 > 0 \rightarrow x^2 > 4$

$x > 2 \vee x < -2$

ب) $y = \log_2 \frac{1}{x}$

$\frac{1}{x} > 0 \rightarrow x > 0$

$-1 < x < 1$

$D_f = (-1, 1)$

سوال 6

سوال 5 و 6 را با جابجایی بنویسید