

نام و نام خانوادگی ^{سروش} ^{احسان} پاسخنامه تشریحی تکلیف شماره ۵ ... کلاس ۲ ... ^{پسر} ^{دفعه} B

الف) $2\cos x + 1 \neq 0 \Rightarrow 2\cos x \neq -1 \Rightarrow \cos x \neq -\frac{1}{2}$
 $\Rightarrow x \neq \{2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}\} \Rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}\}$
 ب) $\cos x - 1 \neq 0 \Rightarrow \cos x \neq 1 \Rightarrow D_f = \mathbb{R} - \{2k\pi\}$

الف) $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1 \Rightarrow x \neq \{\frac{3\pi}{4}, \frac{5\pi}{4}\}$
 $\tan x \in \mathbb{R} \Rightarrow \cos x \neq 0 \Rightarrow x \neq \{\frac{\pi}{2}, \frac{3\pi}{2}\}$
 $\Rightarrow D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}, k\pi - \frac{\pi}{2}\}$
 ب) $\cot x - 1 \neq 0 \Rightarrow \cot x \neq 1 \Rightarrow D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}\}$
 $\cot x \in \mathbb{R} \Rightarrow \sin x \neq 0$

الف) $\sin y = x^2 - 2 \Rightarrow -1 \leq x^2 - 2 \leq 1 \Rightarrow x^2 \leq 3 \quad 1 \leq x^2 \Rightarrow 1 \leq x^2 \leq 3$
 $\Rightarrow 1 \leq x \leq \sqrt{3} \text{ و } -\sqrt{3} \leq x \leq -1 \Rightarrow D_f = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$
 ب) $\arccos(\sqrt{x} - 3) \Rightarrow -1 \leq \sqrt{x} - 3 \leq 1 \Rightarrow 2 \leq \sqrt{x} \leq 4$
 $\Rightarrow 4 \leq x \leq 16 \Rightarrow D_f = [4, 16]$

الف) $\cos y = |x| - 3 \Rightarrow -1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow 2 \leq x \leq 4$
 $\text{و } -4 \leq x \leq -2 \Rightarrow D_f = [-4, -2] \cup [2, 4]$
 ب) $y = \arcsin(x^2 + 3x + 1) \Rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow -2 \leq x^2 + 3x \leq 0$
 $\Rightarrow -2 \leq x(x+3) \leq 0$
 $0, -5, -2, 0$ $\frac{-3 \pm \sqrt{9-4}}{2} = \frac{-3 \pm \sqrt{5}}{2}$ $0 \leq x^2 + 3x + 1 \leq 1 \Rightarrow \frac{-3}{2} \leq x \leq \frac{-1}{2}$
 $-2, -1 \Rightarrow \frac{-3}{2}, -1 \Rightarrow [-\frac{3}{2}, 0] \cap (-\infty, -2] \cup [-1, +\infty)$

$\Rightarrow D_f = [-\frac{3}{2}, -2] \cup [-1, 0]$
 الف) $\log_{\frac{1}{3}}(x^2 - 4) \Rightarrow x^2 - 4 > 0 \Rightarrow x^2 > 4 \Rightarrow x > 2 \text{ و } x < -2$
 $\Rightarrow D_f = (-\infty, -2) \cup (2, +\infty)$
 ب) $y = \log_{\frac{1}{2}}(-|x|) \Rightarrow 2 - |x| > 0 \Rightarrow 2 > |x| \Rightarrow 2 > x > -2$
 $\Rightarrow D_f = (-2, 2)$

الف) $y = \log_{x-2} (x-3)$ $\Rightarrow x-3 > 0 \Rightarrow x > 3$, $x-2 \neq 1 \Rightarrow x \neq 3$
 $\Rightarrow D_f = (3, \infty) - \{3\}$

ب) $y = \log_{x+2} (x^2-1)$ $\Rightarrow x^2-1 > 0 \Rightarrow x^2 > 1 \Rightarrow x > 1$, $x \neq -1$
 $x+2 > 0 \Rightarrow x > -2$, $x+2 \neq 1 \Rightarrow x \neq -1$
 $\Rightarrow D_f = (-2, -1) \cup (1, +\infty) - \{-1\}$

الف) $y = \log_{x-2} (x^2-4x+3)$ $\Rightarrow \frac{(x-1)(x-3)}{x-2} > 0$ (نقطة) $\rightarrow 1, 3$
 $\frac{1}{-} + \frac{+}{+} \Rightarrow D_f = (1, +\infty) - \{3\}$

ب) $y = \log_{x+2} \frac{x+3}{x-2}$ $\Rightarrow \frac{x+3}{x-2} > 0 \Rightarrow x \neq 2$, $x > 2$, $x \neq -2$
 $x+2 > 0 \Rightarrow x > -2$, $x+2 \neq 1 \Rightarrow x \neq -1$ $\Rightarrow D_f = (-2, -1) \cup (2, +\infty) - \{-1\}$

الف) $y = \sqrt{3-\log_2 (x-2)}$ $\Rightarrow x-2 > 0 \Rightarrow x > 2$
 $3-\log_2 (x-2) \geq 0 \Rightarrow 3 \geq \log_2 (x-2) \Rightarrow x-2 \leq 8 \Rightarrow x \leq 10$
 $\Rightarrow D_f = [2, 10]$

ب) $y = \log_2 (2 \log_2^x - 1)$ $\Rightarrow x > 0$
 $2 \log_2^x - 1 > 0 \Rightarrow 2 \log_2^x > 1 \Rightarrow \log_2^x > \frac{1}{2}$
 $\Rightarrow x > \sqrt{2} \Rightarrow D_f = (\sqrt{2}, +\infty)$

الف) $y = \frac{2}{e^x+1}$ $\Rightarrow e^x+1 \neq 0 \Rightarrow e^x \neq -1 \Rightarrow D_f = \mathbb{R}$

ب) $y = \frac{5}{e^x-1}$ $\Rightarrow e^x-1 \neq 0 \Rightarrow e^x \neq 1 \Rightarrow x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$

ج) $y = \frac{5}{e^x-2}$ $\Rightarrow e^x-2 \neq 0 \Rightarrow e^x \neq 2 \Rightarrow x \neq \log_2 2 \Rightarrow D_f = \mathbb{R} - \{1\}$

د) $y = \frac{2}{e^x-3}$ $\Rightarrow e^x-3 \neq 0 \Rightarrow e^x \neq 3 \Rightarrow x \neq \log_2 3 \Rightarrow D_f = \mathbb{R} - \{\log_2 3\}$

الف) $y = (x+1)!$ $\Rightarrow x+1 \in \mathbb{N} \Rightarrow x \in \mathbb{N} - 1 \Rightarrow x \in \frac{\mathbb{N}-1}{1}$
 $\Rightarrow D_f = \{x \mid x \geq \frac{K-1}{1}, K \in \mathbb{N}\}$

ب) $y = (\frac{x-2}{x-3})!$ $\Rightarrow \frac{x-2}{x-3} \in \mathbb{N}$

~~Handwritten scribbles and crossed-out text.~~

$\Rightarrow x = \frac{-\mathbb{N}+2}{x-3} \Rightarrow D_f = \{x \mid x \geq \frac{K-2}{x-3}, K \in \mathbb{N}\}$