

نام و نام خانوادگی مجید خاکی / شریانی پاسخنامه تشریحی تکلیف شماره کلاس ر R

الف) $\sin x - 2 = 0 \Rightarrow \sin x = 2$ $Df = R - \{2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2}\}$ $\sin x \neq \frac{1}{2} \Rightarrow x \neq 2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}$

ب) $y = \frac{\sin x - 2}{2 \cos x + 1} \Rightarrow 2 \cos x + 1 \neq 0 \Rightarrow 2 \cos x \neq -1 \Rightarrow \cos x \neq -\frac{1}{2} \Rightarrow x \neq 2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}$

$Df = R - \{2k\pi\}$

الف) $y = \frac{\sin x + 1}{\tan x + 1} \Rightarrow \frac{\sin x}{\cos x} + 1 \neq 0 \Rightarrow \frac{\sin x}{\cos x} \neq -1 \Rightarrow \sin x \neq -\cos x \Rightarrow \tan x \neq -1 \Rightarrow x \neq 2k\pi - \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}$

ب) $y = \frac{\cos x + 1}{\cot x - 1} \Rightarrow \frac{\cos x}{\sin x} - 1 \neq 0 \Rightarrow \frac{\cos x}{\sin x} \neq 1 \Rightarrow \cos x \neq \sin x \Rightarrow x \neq \frac{\pi}{4}, \frac{5\pi}{4}$

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

الف) $\sin y = x^2 - 2 \Rightarrow -1 \leq x^2 - 2 \leq 1 \Rightarrow 1 \leq x^2 \leq 3 \Rightarrow 1 \leq x \leq \sqrt{3} \text{ or } -\sqrt{3} \leq x \leq -1$

ب) $x = \arccos \{\sqrt{x} - 3\}$ $\sqrt{x} - 3 \in [-1, 1] \Rightarrow 2 \leq \sqrt{x} \leq 4 \Rightarrow 4 \leq x \leq 16$

$Df = [1, \sqrt{3}] \cup [-\sqrt{3}, -1]$

الف) $\cos y = |x| - 3 \Rightarrow -1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow x \in [-4, -2] \cup [2, 4]$

ب) $y = \arcsin(x^2 + 3x + 1)$ $-1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \in [-2, 0] \Rightarrow x \in [-4, -1] \cup [0, 1]$

$Df = [-4, -1] \cup [0, 1]$

الف) $y = \log_r \frac{x^2 - 4}{r}$ $r > 0, r \neq 1$ $\frac{x^2 - 4}{r} > 0 \Rightarrow x^2 > 4 \Rightarrow x > 2 \text{ or } x < -2$

ب) $y = \log_r \frac{2 - |x|}{r}$ $\frac{2 - |x|}{r} > 0 \Rightarrow 2 > |x| \Rightarrow -2 < x < 2$

$Df = (-2, 2)$

الف) $\log_{x-2}^{a-x}$ $a-x > 0$ $a > x$
 $x-2 > 0$ $x > 2$ $Df = (2, a) - \{2\}$

ب) $\log_{x+3}^{x^2-1}$ $x^2-1 > 0$ $x^2 > 1 \Rightarrow x > 1, x < -1$ (γ) 6
 $x+3 > 0$ $x > -3$
 $x+3 \neq 1 \Rightarrow x \neq -2$ $Df = (-3, -1) \cup (-1, +\infty) - \{-2\}$

الف) $\log_{x+3}^{x^2-5x+3}$ $x \neq 1, 3$
 $Df = (1, +\infty) - \{3\} \Rightarrow x \neq 3 \Rightarrow \frac{(x-1)(x-3)}{(x+3)} > 0 \Rightarrow x-1 > 0 \Rightarrow x > 1$ $(1, +\infty)$ 7

ب) $\log_{x+5}^{\frac{x^2}{x+2}}$ $\frac{x^2}{x+2} > 0 \Rightarrow x \neq 2, x \neq -3$
 $x+5 > 0$ $x > -5$ $Df = (-5, -3) \cup (2, +\infty) - \{-3\}$
 $x+5 \neq 1 \Rightarrow x \neq -4$ $(-5, -3)$

الف) $\sqrt{3 - \log_2^{(x+1)}}$ $x-2 > 0 \Rightarrow x > 2 \Rightarrow x-2 \leq 1 \Rightarrow x \leq 4$
 $2 > 0$ $2 \neq 1$ $Df = (2, 4]$ (γ) 8

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

الف) $y = \frac{2}{x^2+1} \Rightarrow x^2+1 > 0 \Rightarrow x^2 > -1 \Rightarrow x = R \Rightarrow Df = IR$

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

ج) $y = \frac{2}{x^2-2} \Rightarrow x^2-2 \neq 0 \Rightarrow x^2 \neq 2 \Rightarrow x \neq \pm \sqrt{2} \Rightarrow Df = R - \{\pm \sqrt{2}\}$

د) $y = \frac{2}{x^2-2} \Rightarrow x^2-2 \neq 0 \Rightarrow x^2 \neq 2 \Rightarrow x \neq \pm \sqrt{2} \Rightarrow Df = R - \{\pm \sqrt{2}\}$ (γ) 9

الف) $(x+1)!$ $x+1 \in \mathbb{N}$ $x = \frac{n-1}{2} \Rightarrow Df = \{x \mid x = \frac{k-1}{2}, k \in \mathbb{N}\}$

ب) $\left(\frac{x-1}{x-2}\right)!$ $\frac{x-1}{x-2} \in \mathbb{N} \Rightarrow x = \frac{p-2w}{p-2w} \Rightarrow Df = \{x \mid x = \frac{k-2}{2k-2}, k \in \mathbb{N}, k \neq \frac{2}{p}\}$ (γ) 10