

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۳... کلاس:
 ۱۹/۲۵

الف) $2x^3 + 3x^2 - 11x + 3 \neq 0 \rightarrow 2 - 1 + 3 + 0 = 0 \rightarrow x=1$ به بخش دیگر $\rightarrow x=1 \rightarrow 2x^2 + 5x - 3 = 2x^2 + 5x - 3 = 0 \rightarrow (x-1)(2x^2 + 0x - 3) \rightarrow \Delta = 25 + 24 = 49 \rightarrow x = \frac{-5 \pm \sqrt{49}}{4} = \frac{-5 \pm 7}{4} = \frac{2}{4} = \frac{1}{2} \text{ و } \frac{-12}{4} = -3$ $\rightarrow Df = IR - \{1, \frac{1}{2}, -3\}$ ب) $2 + 10 - 9 - 3 = 0 \rightarrow x = -1$ به بخش دیگر است $\rightarrow (x+1)(2x^2 + 7x + 3) = 2x^2 + 7x + 3 = 0 \rightarrow \Delta = 49 - 24 = 25 \rightarrow x = \frac{-7 \pm 5}{4} = \frac{-2}{4} = -\frac{1}{2} \text{ و } \frac{-12}{4} = -3$ $Df = IR - \{-1, -\frac{1}{2}, -3\}$	۱
الف) $x^3 - 2x^2 + 2x - 1 = 0 \rightarrow x^3 - 2x^2 + 2x - 1 = 0 \rightarrow (x-1)(x^2 - x + 1) = 0 \rightarrow x=1$ به بخش دیگر است $\rightarrow x^2 - x + 1 = 0 \rightarrow \Delta = 1 - 4 = -3 < 0$ ریشه ندارد $Df = IR - \{1\}$ ب) $x^3 - 2x^2 + 2x - 1 \neq 0 \rightarrow (x-1)(x^2 - x + 1) \neq 0 \rightarrow x \neq 1$ $\frac{x+3}{x^3 - 2x^2 + 2x + 1} \geq 0 \rightarrow \frac{x+3}{(x-1)(x^2 - x + 1)} \geq 0$ (چون $x^2 - x + 1 > 0$) $\rightarrow \frac{x+3}{x-1} \geq 0 \rightarrow x \in (-\infty, -3] \cup (1, +\infty)$ $Df = (-\infty, -3] \cup (1, +\infty)$	۲
$x^2 - 5 x-1 - 2x + 5 \neq 0$ اگر $x \geq 1 \rightarrow x-1 = x-1 \rightarrow x^2 - 5(x-1) - 2x + 5 = x^2 - 7x + 10 = (x-5)(x-2) = 0 \rightarrow x=2 \text{ و } x=5$ اگر $x < 1 \rightarrow x-1 = -x+1 \rightarrow x^2 - 5(-x+1) - 2x + 5 = x^2 + 3x = x(x+3) = 0 \rightarrow x=0 \text{ و } x=-3$ $Df = IR - \{2, 5, 0, -3\}$	۳
الف) $[-x] - 2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow x \leq -2 \rightarrow Df = (-\infty, -2]$ ب) $[x^2] - 2[x] - 3 \neq 0 \rightarrow ([x]^2 + 1)([x] - 3) \neq 0$ اگر $[x]^2 + 1 = 0 \rightarrow -1 \leq x < 0$ اگر $[x] - 3 = 0 \rightarrow 3 \leq x < 4$ $Df = IR - \{[-1, 0) \cup [3, 4)\}$	۴
الف) $[0, \frac{1}{3}] + [x + \frac{2}{3}] \geq 0 \rightarrow x \geq -\frac{1}{3} \rightarrow Df = [-\frac{1}{3}, +\infty)$ ب) $[x - \frac{1}{3}] + [-x + \frac{2}{3}] \geq 0 \rightarrow [x] + [-x] \geq 0 \rightarrow x \in \mathbb{Z} \rightarrow 0 \checkmark$ $Df = \{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\}$	۵

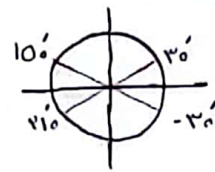
الف) $y = \frac{\cot x + 1}{\tan x + 1}$ $\cot \rightsquigarrow x \neq k\pi$ $\tan \rightsquigarrow x \neq k\pi + \frac{\pi}{2}$

$\tan x + 1 \neq 0 \rightarrow x \neq k\pi + \frac{\pi}{4} \rightarrow Df = \mathbb{R} - \{k\pi\} - \{k\pi + \frac{\pi}{4}\} - \{k\pi + \frac{3\pi}{4}\}$
 $\tan x + 1 \neq 0 \rightarrow \tan x \neq -1$

ب) $1 - \sin^2 x \geq 0 \rightarrow \sin^2 x \leq \frac{1}{4} \rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$

$k\pi - \frac{\pi}{6} \leq x \leq k\pi + \frac{\pi}{6}$

پایین صند از دایره یکتا

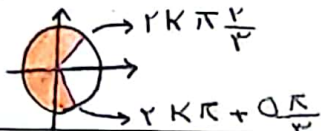


اینها را اصلاً بازه نداریم

الف) $2\sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{2} \rightsquigarrow 2k\pi + \frac{\pi}{6} \leq x \leq 2k\pi + \frac{5\pi}{6}$



ب) $1 - 2\cos x \geq 0 \rightarrow \cos x \leq \frac{1}{2} \rightarrow 2k\pi + \frac{2\pi}{3} \leq x \leq 2k\pi + \frac{4\pi}{3}$



الف) $-1 \leq x^2 + 3x + 1 \leq 1 \rightarrow -1 \leq x^2 + 3x + 1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0$

$x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow (-\infty, -3] \cup [-1, +\infty)$
 $x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0 \rightarrow (-\infty, -2] \cup [-1, +\infty)$
 $Df = [-3, -2] \cup [-1, +\infty)$

ب) $0 \leq \sqrt{0-2x} \leq 1 \rightarrow 0 \leq 0-2x \leq 1 \rightarrow 0-2x \geq 0 \rightarrow x \leq \frac{0}{2}$

$0-2x \leq 1 \rightarrow 2x \geq -1 \rightarrow x \geq -\frac{1}{2} \rightarrow Df = [-\frac{1}{2}, 0]$

الف) $1 - \log_{\frac{x}{3}} > 0 \rightarrow \log_{\frac{x}{3}} < 1 \rightarrow x < 3$
 $\log_{\frac{x}{3}} > 0 \rightarrow x > 0$
 $Df = (0, 3)$

ب) $1 - \log_{\frac{1}{x}} > 0 \rightarrow \log_{\frac{1}{x}} < 1 \rightarrow x > \frac{1}{2}$
 $Df = (\frac{1}{2}, +\infty)$

الف) $2^{4x} - x^2 - 1 \geq 0 \rightarrow 2^{4x} - x^2 \geq 1 \rightarrow x^2 - 4x + 3 \leq 0 \rightarrow (x-1)(x-3) \leq 0$

$Df = [1, 3]$

ب) $\left(\frac{3x+0}{2x+5}\right) \neq 0 \rightarrow 2x+5 \neq 0 \rightarrow x \neq -\frac{5}{2} \rightsquigarrow \frac{3x+0}{2x+5} \in \mathbb{W} \rightarrow \frac{3x+0}{2x+5} = k$

$Df = \left\{ \frac{0-5k}{2k-3} \mid k \in \mathbb{W} \right\} - \left\{ -\frac{5}{2} \right\}$
 $5-4k = -4k+5 \rightarrow 5=5$
 طبق الگوریتم به دست آوردی و هیچ وقت برابر 2 نمی شود

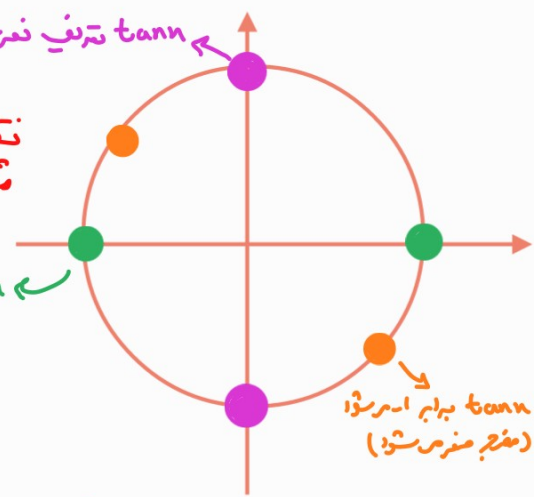
$3x+0 = 2xk+5k \rightarrow x = \frac{0-5k}{2k-3}$

4- الف) $y = \frac{\cot x + 1}{\tan x + 1}$

→ نقاط نامطلوب را در دایره
مستثنی می‌کنیم.

$\cot x$ تعریف نمی‌شود

$\tan x$ تعریف نمی‌شود



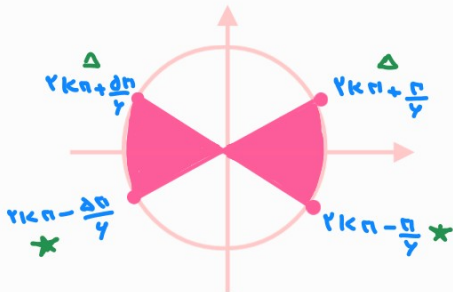
$x \neq k\pi + \frac{\pi}{2}$

$x \neq k\pi + \frac{\pi}{2} \cup x \neq k\pi$

$\hookrightarrow x \neq \frac{k\pi}{2}$

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

4- ب) $1 - 4\sin^2 x \geq 0 \rightarrow 4\sin^2 x \leq 1 \rightarrow \sin^2 x \leq \frac{1}{4} \rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$



$\rightarrow D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$