۲۰ آفرین!

دهم تجربی B — تکلیف ۵ — الیا نادری — Year. Month. Date. ( )

۱)

$$\frac{\sin x - 2}{2\cos x + 1} \qquad 2\cos x + 1 \neq 0 \qquad \cos x \neq -\frac{1}{2}$$

$$R - \left\{ \frac{2\pi}{3} + 2k\pi , \frac{4\pi}{3} + 2k\pi \mid k \in Z \right\}$$

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$$\frac{\sin x + 3}{\cos x - 1} \qquad \cos x - 1 \neq 0 \rightarrow \cos x \neq 1$$

$$R - \{ 2k\pi \mid k \in Z \}$$

۲)

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$$\frac{2\sin x + 1}{\tan x + 1} \qquad \tan x + 1 \neq 0 \qquad \tan x \neq -1 \qquad x \neq -\frac{\pi}{4} + k\pi$$

$$x \neq \frac{\pi}{2} + k\pi \mid k \in Z$$

$$R - \left\{ \frac{\pi}{2} + k\pi , -\frac{\pi}{4} + k\pi \mid k \in Z \right\}$$

$$\frac{\cos x + 1}{\cot x - 1} \qquad \sin x \neq 0 \qquad x \neq k\pi \ (k \in Z)$$

$$\cot x - 1 \neq 0 \qquad \cot x \neq 1$$

$$x = \frac{\pi}{4} + k\pi \ (k \in Z)$$

$$R - \left\{ k\pi , \frac{\pi}{4} + k\pi \mid k \in Z \right\}$$

۳)

$$\sin y = x^2 - 2 \qquad -1 \leq x^2 - 2 \leq 1$$

$$-1 \leq x^2 - 2 \rightarrow x^2 \geq 1 \qquad \underline{x^2 - 2 \leq 1 \rightarrow x^2 \leq 3}$$

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$$1 \leq x^2 \leq 3 \qquad [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$$

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$y = \arccos(\sqrt{x} - 3) \Rightarrow x \geq 0$

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

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

$D_f = [4, 16]$

$\cos y = |x| - 3 \qquad \cos y \in [-1, 1]$ ۴)

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$-1 \leq |x| - 3 \leq 1 \qquad |x| - 3 \geq -1 \qquad |x| \geq 2$

$|x| - 3 \leq 1 \qquad |x| \leq 4 \qquad 2 \leq |x| \leq 4$

$D_f = [-4, -2] \cup [2, 4]$

$y = \arcsin(x^2 + 3x + 1) \qquad -1 \leq x^2 + 3x + 1 \leq 1$

$x^2 + 3x + 1 \geq -1 \qquad x^2 + 3x + 2 \geq 0 \qquad (x+1)(x+2) \geq 0$

$x \leq -2 \qquad x \geq -1 \qquad x^2 + 3x + 1 \leq 1 \qquad x^2 + 3x \leq 0$

$x(x+3) \leq 0 \qquad -3 \leq x \leq 0 \qquad D_f = [-3, -2] \cup [-1, 0]$

۵) 2

$y=\log_{3}(x^2-4)$ $\quad x^2-4>0 \quad x^2>4$

$x>2$

$D_f=(-\infty,-2)\cup(2,\infty) \quad x<-2$

$y=\log_{2}(2-|x|) \quad 2-|x|>0 \quad |x|<2$

$D_f = x\in(-2,2)$

۶)

$y=\log_{x-3}(5-x) \quad 5-x>0 \rightarrow x<5$

$x-3>0 \rightarrow x>3$ 2

$D_f=(3,4)\cup(4,5) \quad x-3\neq 1 \rightarrow x\neq 4$

$y=\log_{x+3}(x^2-1) \quad x^2-1>0 \rightarrow (x-1)(x+1)>0$

$x>1 \,,\, x<-1$

$x+3>0 \rightarrow x>-3 \quad x+3\neq 1 \rightarrow x\neq -2$

$D_f=(-3,-2)\cup(-2,-1)\cup(1,\infty)$

۷)

$y=\log \dfrac{x^2-4x+3}{x-3} \quad \dfrac{x^2-4x+3}{x-3}>0$

$\dfrac{(x-1)(x-3)}{x-3}=x-1 \,,\, x\neq 3 \quad x\in(1,3)\cup(3,\infty)$

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$y = \log_{x+5} \frac{x+3}{x-2}$ $\quad \frac{x+3}{x-2} > 0$ $\quad x+5 > 0 \rightarrow x > -5$

$x+5 \neq 1 \rightarrow x \neq -4$

$x < -3$

$x > 2$

$D_f = (-5,-4) \cup (-4,-3) \cup (2,\infty)$

۸) ۲

$y = \sqrt{3 - \log_{2}(x-2)} \rightarrow x-2 > 0 \rightarrow x > 2$

$3 - \log_{2}^{x-2} \geqslant 0 \rightarrow \log_{2}^{x-2} \leqslant 3$

$x-2 \leqslant 2^3 = 8 \rightarrow x \leqslant 10 \quad D_f = (2,10]$

$y = \log(2\log_{3}^{x} - 1) \quad 2\log_{3}^{x} - 1 > 0$

$2\log_{3}^{x} > 1 \quad \log_{3}^{x} > \frac{1}{2} \quad \log_{3}^{x} > \frac{1}{2} \rightarrow x > \sqrt{3}$

$x \in (\sqrt{3},\infty)$

۹) ۲

$y = \frac{3}{4^x + 1} = \quad 4^x + 1 > 0 \rightarrow x \in R$

$D_f = R$

$y = \frac{3}{4^x - 1} \rightarrow 4^x - 1 \neq 0 \rightarrow 4^x \neq 1 \quad x \neq 0$

$D_f = R - \{0\}$

$y=\frac{3}{4^x-2}$ $\quad 4^x-2\neq 0\to 4^x\neq 2\Rightarrow x\neq\frac{1}{2}$

$D_f\{R-\frac{1}{2}\}$

$y=\frac{3}{4^x-3}\to 4^x-3\neq 0\quad 4^x\neq 3\to x\neq\log_4^3$

$D_f=R-\{\log_4^3\}$

$y=(4x+1)!\quad 4x+1\in W$ $\quad$ (۱۰

$4x+1=n$

$x\in\{-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,\dots\}\quad x=\frac{n-1}{4}\to n=0,1,2$

$n\in Z\geq 0\to\frac{n-1}{4}\quad D_f\{x=\frac{n-1}{4},n=0,1,2,\dots\}$

$\left(\frac{3x-2}{2x-5}\right)!=\quad 2x-5\neq 0\to x\neq\frac{5}{2}$

$\frac{3x-2}{2x-5}=n,\ n\in\{0,1,2,\dots\}$

$3x-2=n(2x-5)$

این بهتر است و درست تر است

$D_f=\{x\mid x=\frac{5k-2}{2k-3},\ k\in W\}$

$3x-2=2nx-5n$

$3x-2nx=-5n+2\to x(3-2n)=2-5n$

فرض $x=\frac{2-5n}{3-2n}\to n\neq\frac{3}{2},\ \cancel{n=}\ 0,1,2$