نام و نام خانوادگی: فاطمه زهرا اجاق زاده   شماره تکلیف: 4   کلاس: دهم دختر A
Subject:

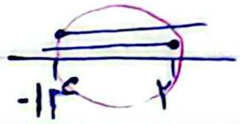
۱) الف) $y=\sqrt{4-\sqrt{2-x}}$ $2-x\geq 0$

$2\geq x \to x\leq 2$

$4-\sqrt{2-x}\geq 0$

$(4)^2\geq(\sqrt{2-x})^2$

$16\geq 2-x \to 14\geq -x \to -14\leq x \to x\geq -14$



$\to \boxed{D_f=[-14,2]}$

ب) $y=\sqrt{3-\sqrt{x-2}}$ $\to x-2\geq 0 \to x\geq 2$

$3-\sqrt{x-2}\geq 0 \to 3^2\geq(\sqrt{x-2})^2$

$9\geq x-2 \to 11\geq x \to x\leq 11$

$\to \boxed{D_f=[2,11]}$

۲) الف) $y=\sqrt{4-2x^2}$ $4-2x^2\geq 0 \to 4\geq 2x^2$

$2\geq x^2 \to x^2\leq 2$

$-\sqrt{2}\leq x\leq\sqrt{2} \to \boxed{D_f=[-\sqrt{2},\sqrt{2}]}$

ب) $y=\sqrt{3|x|-9}$ $3|x|\geq 9$

$|x|\geq 3$ $x\geq 3$, $x\leq -3$ $\to \boxed{D_f=(-\infty,-3]\cup[3,\infty)}$

۳) الف) $y=\sqrt[3]{\frac{|x|+1}{|x|-3}}$ $|x|-3\neq 0$

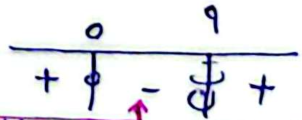
$|x|\neq 3$ $x\neq\pm 3$

$D_f=R-\{\pm 3\}$
یا $D_f=(-\infty,-3)\cup(3,+\infty)$

ب) $y=\sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}}$ $\sqrt{x}-3\neq 0 \to \sqrt{x}\neq 3$

$x\neq 9$

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



چون شرط داریم باید قسمت مثبت را انتخاب کرد

* در این ۲ تابع چون فرجه رادیکال فرد است محدودیت تنها روی مخرج است

$\boxed{D_f=[0,9)\cup(9,+\infty)}$

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۴) الف) $y=\dfrac{\sqrt{3-|x|}}{|x|+2} \rightsquigarrow 3-|x|\geq 0$

$3\geq |x| \to |x|\leq 3$

$-3\leq x\leq 3$

$\boxed{D_f=[-3,3]}$

$|x|+2\neq 0 \to |x|\neq -2$ ✓ همواره برقرار

ب) $y=\dfrac{\sqrt{4-x^2}}{|x|-1} \rightsquigarrow 4-x^2\geq 0 \to 4\geq x^2 \to x^2\leq 4$

$-2\leq x\leq 2$

$|x|-1\neq 0 \to |x|\neq 1 \to x\neq \pm 1$

$\boxed{D_f=[-2,2]-\{\pm 1\}=[-2,-1)\cup(-1,1)\cup(1,2]}$

۵) الف) $y=\dfrac{x+1}{\sqrt{x+|x|}} \to x+|x|>0 \begin{cases} \oplus & ✓ \\ 0 & \times \\ \ominus & \times \end{cases}$ ⟶ هر عدد منفی بگذاریم مخرج صفر می‌شود که تعریف نشده است

$\boxed{D_f=R^+=(0,+\infty)}$

ب) $y=\dfrac{1}{\sqrt{x|x|}} \rightsquigarrow x|x|>0 \to \begin{cases} \oplus & ✓ \\ 0 & \times \\ \ominus & \times \end{cases}$ $\xrightarrow{\text{مثال نقض}} \sqrt{-1(|-1|)}=\sqrt{-1}\ \times$

$\boxed{D_f=R^+}$

۶) الف) $y=\sqrt{2-[x]}$

$2-[x]\geq 0$

$\left.\begin{array}{l} 2\geq [x] \to [x]\leq 2 \\ x<3 \end{array}\right\} \to \boxed{D_f=(-\infty,3)}$

ب) $y=\dfrac{1}{\sqrt{2-[x]}}$

$2-[x]>0$

$\left.\begin{array}{l} 2>[x] \to [x]<2 \\ x<2 \end{array}\right\} \to \boxed{D_f=(-\infty,2)}$

۷) الف) $y=\dfrac{1}{x[x]}$

$x[x]\neq 0 \xrightarrow{if} \begin{cases} x=0 \\ [x]=0 \to 0\leq x<1 \end{cases}$

$\boxed{D_f=R-[0,1)}$

ب) $y=\dfrac{1}{\sqrt{-x[x]}}$ $\quad -x[x]>0$

$\oplus \xrightarrow{\text{if } x=1} -1([1])=-1$ ✗

$\ominus \xrightarrow{\text{if } x=-1} +1([-1])=-1$ ✗

$\odot \xrightarrow{\text{if } x=0}$ صفر $=0$ ✗

$\boxed{D_f=\varnothing}$

18)

الف) $y=\sqrt{\left[x-\frac{1}{3}\right]+\left[x+\frac{2}{3}\right]} \longrightarrow \left[x-\frac{1}{3}\right]+\left[x+\frac{2}{3}\right]\geqslant 0$

$$\left[x+\frac{2}{3}-1\right]+\left[x+\frac{2}{3}\right]\geqslant 0 \longrightarrow \left[x+\frac{2}{3}\right]-1+\left[x+\frac{2}{3}\right]\geqslant 0$$

$$2\left[x+\frac{2}{3}\right]\geqslant 1 \longrightarrow \left[x+\frac{2}{3}\right]\geqslant\frac{1}{2} \longrightarrow x+\frac{2}{3}\geqslant 1$$

$$\Rightarrow x\geqslant\frac{1}{3}$$

$\boxed{D_f=\left[\frac{1}{3},+\infty\right)}$

ب) $y=\sqrt{\left[x-\frac{1}{3}\right]+\left[-x+\frac{1}{3}\right]} \longrightarrow \sqrt{\left[x-\frac{1}{3}\right]+\left[-\left(x-\frac{1}{3}\right)\right]}$

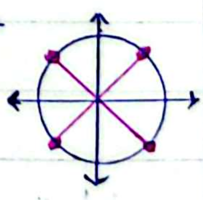
$$\xrightarrow{\text{if}} \begin{cases} a\in Z & [a]+[-a]=0 \\ a\notin Z & [a]+[-a]=-1 \end{cases} \Rightarrow x-\frac{1}{3}\in Z$$

$\boxed{D_f=\left\{x \mid x=k+\frac{1}{3},\ k\in Z\right\}}$

19)

الف) $y=\dfrac{1}{2\sin^2 x-1}$ $\quad 2\sin^2 x-1\neq 0$

$$\sin^2 x\neq\frac{1}{2} \rightarrow \sin x\neq\pm\frac{\sqrt{2}}{2}$$



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

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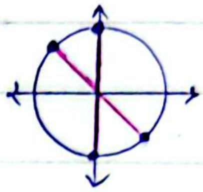
$x \neq k\pi + \frac{3\pi}{4}$

ب) $y = \frac{\cot x + 1}{\tan x + 1}$ $\qquad \tan x + 1 \neq 0 \rightarrow \tan x \neq -1$

$\tan = \frac{\sin}{\cos} \Rightarrow \cos x \neq 0$

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



$\boxed{D_f = R - \{k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{4}\}}$

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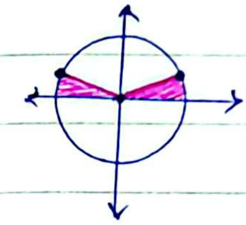
۱۰) الف) $y = \sqrt{2\sin x - 1}$ $\qquad 2\sin x - 1 \geq 0$

$\sin x \geq \frac{1}{2}$

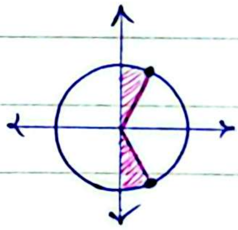


$\boxed{D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]}$

ب) $y = \sqrt{1 - 2\cos x}$ $\qquad 1 - 2\cos x \geq 0$

$1 \geq 2\cos x$

$\frac{1}{2} \geq \cos x \rightarrow \cos x \leq \frac{1}{2}$



$\boxed{D_f = [2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}]}$