۱۸/۲۵

۱)

$۲x^۲+y^۲-۴x+۶y+k=0 \to (\sqrt{۲}x-\sqrt{۲})^۲+(y+۳)^۲ \to ۲x^۲+۲+۴x+y^۲+۹+۶y$

$k=۹+۲=۱۱$

۲

$a^۲+۴a=۲a+a+۲ \to a^۲+۴a=۳a+۲ \to a^۲+a-۲=0 \to (a-۲)(a+۱)$

$\boxed{a=۲}$, $a=-۱$ غ ق ق $۱\leq۲ \to ۲+۲+۲=\boxed{۶}$

$a=۱$ $f(۱)=۵$

۰/۵

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۳)

$-۳ \to ۲\times۹-b \to ۱۸-b$ $۱۸-b=a-۶$

$\ominus۳ \to a-۶ \to a-۶$ $۲۴=a+b \to \boxed{a+b=۲۴}$

۲

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۴)

$۶x-a\geq0 \to ۶x\geq a \to x\geq\frac{a}{۶} \to D_f=[\frac{a}{۶},+\infty)$ $\frac{a}{۶}=۲ \to a=۱۲$

$b-۳x\geq0 \to ۳x\leq b \to x\leq\frac{b}{۳} \to D_f=(-\infty,\frac{b}{۳})$ $\frac{b}{۳}=۲ \to b=۶$

$\frac{b}{a}=\frac{۶}{۱۲}=\frac{۱}{۲}$

۲

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۵)

الف) $y=\sqrt{\frac{x+۱}{|x-۳|}}+\sqrt{\frac{۶-x}{x^۲+۲x+۴}}$

همواره مثبت $۴-۱۶<0$ ریشه ندارد

-۱: $-\ |\ +$ $\to D_f=[-۱,+\infty)-\{۳\}$

۶: $+\ |\ -$ $\to D_f=(-\infty,۶]$

$\cap \to [-۱,۶]-\{۳\}$

ب) $y=\sqrt{[x]-۴}+\sqrt{۲-[x]}$ $[x]-۴\geq0 \to [x]\geq۴ \to D_f=[۴,+\infty)$

$۲-[x]\geq0 \to [x]\leq۲ \to D_f=(-\infty,۳)$ $\cap \to \varnothing$

۲

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۶)

الف $=\sqrt{\frac{x^۲-x-۶}{x^۴-۱۳x^۲+۳۶}}$ $\sqrt{\frac{(x-۳)(x+۲)}{t^۲-۱۳t+۳۶}}$ $t^۲-۱۳t+۳۶ \to (t-۹)(t-۴)$

$x^۲=۹ \to x=\pm۳$ $x^۲=۴ \to x=\pm۲$

-۳ , -۲^* , ۲ , ۳^* : $+\ -\ -\ +\ +$

$(-\infty,-۳)\cup(۲,۳)\cup(۳,+\infty)$

$y=\sqrt{\dfrac{x^3-2x^2-5x+6}{x^3+2x^2-5x-6}}$

$x^3-2x^2-5x+6 \div (x-1) = x^2-x-6$
$-x^3+x^2$
$-x^2-5x+6$
$+x^2-x$
$-6x+6$
$+6x-6$
0

$x^3+2x^2-5x-6 \div (x+1) = x^2+x-6$
$-x^3-x^2$
x^2-5x-6
$-x^2-x$
$-6x-6$
$+6x+6$

$y=\sqrt{\dfrac{(x-1)(x^2-x-6)}{(x+1)(x^2+x-6)}} \rightarrow \sqrt{\dfrac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}}$

-3	-2	-1	1	2	3

$+\ -\ +\ -\ +\ -\ +$

$D_f: (-\infty,-3)\cup[-2,-1)\cup[1,2)\cup[3,+\infty)$

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(7) $y=\sqrt{[-x]-2} \rightarrow [-x]-2\geq 0 \rightarrow [-x]\geq 2$

$D_f: (-\infty,-1)$ ~~-1~~ -2

۱,۷۵

$y=\dfrac{5x^2+6}{[x]^2-2[x]-3} \rightarrow [x]^2-2[x]-3\neq 0 \rightarrow ([x]-3)([x]+1)\neq 0$

$[x]\neq 3,\ [x]\neq -1 \quad D_f: R-[3,4)\cup[-1,0)$

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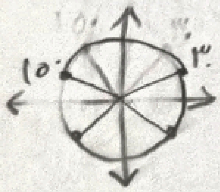
(8) $y=\dfrac{\cot x+1}{\tan x+1} \rightarrow \cos x\neq 0,\ \sin x\neq 0,\ \tan x\neq -1$

$D_f=R-\{k\pi, k\pi+\frac{\pi}{2}, 2k\pi+\frac{3\pi}{4}, 2k\pi+\frac{7\pi}{4}\}$

$D_f: R-\{\frac{k\pi}{2}, k\pi-\frac{\pi}{4}\}$

۵

$y=\sqrt{1-4\sin^2 x} \quad 1-4\sin^2 x\geq 0 \quad 4\sin^2 x\leq 1 \rightarrow \sin^2 x\leq \frac{1}{4} \quad -\frac{1}{2}\leq \sin x\leq \frac{1}{2}$



$D_f: \{k\pi\pm\frac{\pi}{66}, k\pi+\frac{\pi}{6}\}$, ~~$\{2k\pi-\frac{\pi}{6}, 2k\pi+\frac{\pi}{6}\}$~~

$\{2k\pi-\frac{\pi}{6}, 2k\pi+\frac{\pi}{6}\}\cup\{2k\pi+\frac{5\pi}{6}, 2k\pi+\frac{7\pi}{6}\}$

۹)

الف) $g = \sqrt{1 - \log_{\frac{1}{2}}^{x-1}}$ $\quad 1 - \log_{\frac{1}{2}}^{x-1} \geq 0$ $\quad \log_{\frac{1}{2}}^{x-1} \leq 1$ $\quad 0 < \frac{1}{2} < 1$ $\quad x-1 \geq \frac{1}{2}$ $\quad x \geq \frac{3}{2}$

$D_f = [\frac{3}{2}, +\infty)$

ب) $f = \frac{\sqrt{x^2 - x}}{1 - \log_{x^2-3x}^{x^2-3x}}$ $\quad x^2 - x \geq 0$ $\quad x(x-1) \geq 0$

	$-\infty$		0		1		$+\infty$
	+	−		−		+	

$x^2 - 3x \neq 1$ $\quad x^2 - 3x \neq 0$ $\quad x(x-3) \neq 0$

	$-\infty$		0		3		$+\infty$
	+	−		−		+	

$x^2 - 3x \neq 4$ $\quad x^2 - 3x - 4 \neq 0$ $\quad (x-4)(x+1) \neq 0$ $\quad x \neq 4, -1$

$D_f = (-\infty, 0] \cup [3, +\infty) - \{4, -1\}$

$y = \sqrt{2^{4x-x^2} - 1}$ $\quad 2^{4x-x^2} - 1 \geq 0$ $\quad 2^{4x-x^2} \geq 1$ $\quad 2^{4x-x^2} \geq 2^0$ $\quad 4x - x^2 \geq 0$

	0		4
	−	+	

$-x^2 + 4x - 3 \geq 0$ $\quad x^2 - 4x + 3 \leq 0$ $\quad (x-1)(x-3) \leq 0$

	1		3
	+	−	

$D_f = [1, 3]$

$y = \left(\frac{3x+5}{2x+4}\right)!$ $\quad \frac{3x+5}{2x+4} \in W$ $\quad 2xw + 4w = 3x + 5$ $\quad 2xw - 3x = 5 - 4w$

$x(2w - 3) = 5 - 4w$ $\quad x = \frac{5 - 4w}{2w - 3}$ $\quad D_f = \left\{x \mid x = \frac{5 - 4k}{2k - 3}, k \in W\right\}$

$\left(\frac{3x+5}{2x+4}\right)! \underset{x \to w}{=} \frac{4w - 5}{2w - 3}$