-۱

الف) $y = \frac{x+3}{2x^3+3x^2-8x+3} =$ $\qquad \mathbb{R} - \{\frac{1}{2}, -3, 1\}$

لقا رصدای

15

$$\begin{array}{l|l} 2x^3 + 3x^2 - 8x + 3 & x - 1 \\ \hline -2x^3 + 2x^2 & 2x^2 + 5x - 3 \\ \hline 5x^2 - 8x & \\ -5x^2 + 5x & \\ \hline -3x + 3 & \\ +3x - 3 & \\ \hline 0 & \end{array}$$

$x^2 + 5x - 6$

$(x-1)(x+6)$ $\quad$ 1

$\frac{1}{2}$ $\quad$ -3

5

ب) $\frac{x+3}{2x^3+9x^2+10x+3}$ $\qquad \mathbb{R} - \{-1, -\frac{1}{2}, -3\}$

$$\begin{array}{l|l} 2x^3 + 9x^2 + 10x + 3 & x + 1 \\ \hline -2x^3 - 2x^2 & 2x^2 + 7x + 3 \\ \hline 7x^2 + 10x & \\ -7x^2 - 7x & \\ \hline 3x + 3 & \\ -3x - 3 & \\ \hline 0 & \end{array}$$

$x^2 + 7x + 6$

$(x+6)(x+1)$ $\quad$ -1

-3 $\quad$ $-\frac{1}{2}$

۲-

الف) $\dfrac{x+3}{x^3-2x^2+2x-1}$ $\qquad \mathbb{R}-\{1\}$

$$
\begin{array}{r|l}
x^3-2x^2+2x-1 & x-1 \\
\cline{2-2}
-x^3+x^2 & x^2-x+1 \\
\cline{1-1}
-x^2+2x & \searrow \Delta<0 \\
+x^2-x & \\
\cline{1-1}
x-1 &
\end{array}
$$

①

۲

ب) $\sqrt{\dfrac{x+3}{(x-1)\underbrace{(x^2-x+1)}_{\text{همواره }+}}} \geq 0$

		-3		1	
$x+3$	$-$	0	$+$		$+$
$x-1$	$-$		$-$	0	$+$
$p(x)$	$+$	0	$-$	$\nexists$	$+$

$(-\infty,-3]\cup(1,+\infty)$

۳-

$y=\dfrac{3}{x^2-5|x-1|-2x+5}$ $\qquad \mathbb{R}-\{-3,0,2,5\}$

۲

$x-1>0$

$x>1 \longrightarrow x^2-5x+5-2x+5 \Rightarrow x^2-7x+10$ $\qquad \mathbb{R}-\{2,5\}$

$(x-5)(x-2)$ $\quad \searrow 5 \quad \searrow 2$

$x-1<0$

$x<1$ $\qquad \mathbb{R}-\{-3,0\}$

$x^2+5x-5-2x+5 \Rightarrow x^2+3x=0$

$x(x+3)$ $\qquad -3,0$

۴ -

الف) $\dfrac{x+3}{|2x+1|-|x+3|}$

$|2x+1|-|x+3|=0$

$|2x+1|=|x+3|$

$4x^2+1+4x=x^2+9+6x$

$3x^2-8-2x=0$

$3x^2-2x-8=0$

$x^2-2x-24$

$(x-6)(x+4) \longrightarrow 2 \quad \frac{-4}{3}$

$\mathbb{R}-\{2, -\frac{4}{3}\}$

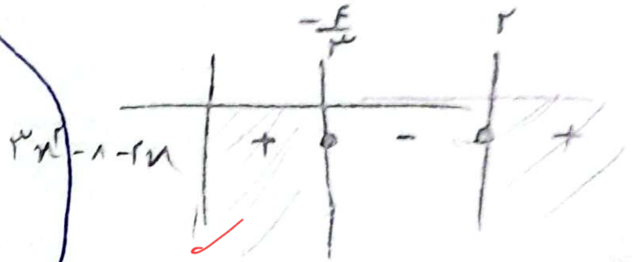
ب)

$|2x+1|-|x+3| \geq 0$

$|2x+1| \geq |x+3|$

$4x^2+1+4x \geq x^2+9+6x$

$3x^2-8-2x \geq 0$



$(-\infty, -\frac{4}{3}] \cup [2, +\infty)$

۵)

الف) $y=\log_2(1-\log_3 x)$

$1-\log_3 x > 0$ $\qquad x>0$

$1 > \log_3 x$

$\log_3 3 > \log_3 x$ $\qquad \mathbb{R}=(0,3)$

$3 > x$

ب) $\log_2(1-\log_{\frac{1}{2}} x)$

$1-\log_{\frac{1}{2}} x > 0$

$1 \cancel{<} \log_{\frac{1}{2}} x$

$\log_{\frac{1}{2}} \frac{1}{2} \cancel{<} \log_{\frac{1}{2}} x$

$\cancel{\frac{1}{2} < x \quad \mathbb{R}=(0, \frac{1}{2})}$

$x>0$

$\mathbb{R}\,(\frac{1}{2}, +\infty)$

(۵) ۱۷

۳- $\log_{3}(1 - \log_{2} X)$

$x > 0$

$1 - \log_{2} x > 0 \rightarrow \log_{2} 2 > \log_{2} x \rightarrow x < 2$

$x > 0$

$\rightarrow 0 < x < 2 \quad (0, +2)$

۴

$\log_{2}(1 - \log_{\frac{1}{2}} X)$

$x > 0$

$1 - \log_{\frac{1}{2}} x > 0 \rightarrow \log_{\frac{1}{2}} \frac{1}{2} < \log_{\frac{1}{2}} x$

$x > \frac{1}{2} \rightarrow R \; (\frac{1}{2}, +\infty)$

۶) $\sqrt{\log_{\frac{1}{5}} \log_{5}(2x-1)}$

$2x - 1 > 0 \rightarrow x > \frac{1}{2}$

$2x - 1 > 1 \rightarrow x > 1$

۰/۵

$0 < \log_{5} 2x-1 \leq \sqrt{5}$

$2x - 1 \leq 5 \rightarrow x \leq 3$

$\log_{\frac{1}{2}} 1 < \log_{5} 2x-1 < \log_{5} \sqrt{5}$

$D_f = (1, 3]$

$1 < 2x - 1 < \sqrt{5} \rightarrow 2x < \frac{\sqrt{5}+1}{2}$

۲) —

$f(x) = \sqrt{(a+2)x^2 + ax + b}$ $(-\infty, 3]$ ۱)

۰/۵

$(a+2=0 \rightarrow a=-2$

$-2x+b=0 \rightarrow b=-6 \rightarrow \sqrt{-2x+6}$

$x=3$ $a=-2$ $D_f\ x[-\infty, +3]$

$\boxed{b=-3}$ $-6+b=0 \Rightarrow b=6$

۹-

$y = \sqrt{x^2+2x-m^2+2}$

$\Delta < 0 \rightarrow 4+4m^2-8=0$

$4m^2-4=0 \quad m=\pm 1 \rightarrow$ ۲

	-1		$+1$	
$+$	0	$-$	0	$+$

۰

۱۰-

$y = \dfrac{\sqrt{4-x^2}}{[x]+[-x]+1}$ $-2 \leq x \leq 2$ عدد

۰

$4-x^2 \geq 0 \rightarrow -2 \leq x \leq 2$

$[x]+[-x]+1 \neq 0 \rightarrow x=-2 \rightarrow 1 \leftarrow x=2$

$x=-1 \quad 1 \quad x=1$

$x=0 \quad 1$