مهدی کاظمی تکلیف شماره ۸

۱-

$f(x)=\sqrt{1-x^2} \rightarrow 1-x^2 \geq 0 \rightarrow -1 \leq x \leq 1 \rightarrow x = 1, 0, -1$

$f(-1)=\sqrt{0}=0$ $\quad g(-1)=1 \quad g(0)=4 \quad g(1)=2$

$f(1)=0$

$f(0)=1$

$x=-1 \rightarrow 2g-3f = 2-0=2$

$x=1 \rightarrow 2g-3f = 4-0=4$

$x=0 \rightarrow 2g-3f = 8-3=5$

$\rightarrow R_f=\{2,4,5\}$

$2+4+5=\boxed{11}$

۲-

$f(x)=2x-1 \rightarrow D_f=[3,+\infty) \rightarrow f(3)=5 \quad R_f=[5,+\infty)$

$g(x)=\frac{1}{3}x+3 \rightarrow D_f=(-\infty,3] \rightarrow g(3)=4 \quad R_f:(-\infty,4]$

$\xrightarrow{\cup} (-\infty,4]\cup[5,+\infty)$

۳-

$y=\frac{-x^2}{2}+x+3 \longrightarrow -\frac{x^2}{2}+x+\frac{3}{2}\geq 0 \longrightarrow x^2-2x-3\leq 0 \longrightarrow a=-1,\ b=3$

$-1 \quad 3$

$+ \mid - \mid +$

$\sqrt{b-a}=\sqrt{4}=2$

۴-

$y=|x-1|+|x-3|+|2x-4|$

	1	2	3
$-4x+8$	$-2x+6$	$2x-2$	$4x-8$

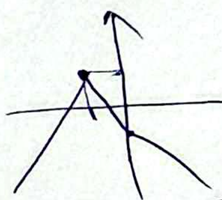
$\min \Rightarrow x=2 \longrightarrow 2$

۵-

$y=|x|-2|x+1|$

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

$R_f:(-\infty,1]$



۶-

$y=\frac{x^2+ax+m}{x+1}$ $\quad y(x+1)=x^2+ax+m \longrightarrow yx+y=x^2+ax+m$

$x^2+ax-yx-y+m=0$

$x^2+(a-y)x+(m-y)=0$

$b^2-4ac \Rightarrow (a-y)^2-4(m-y) \geq 0$

$y^2+2a-10y-4m+4y-y^2-6y+25-4m \xrightarrow{a=5}$

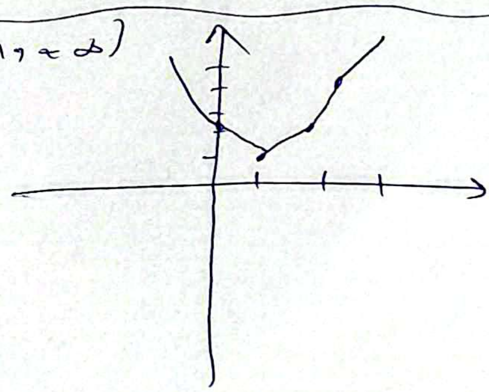
$16m-64\leq 0 \longrightarrow m\leq 4 \longrightarrow m<4,\ m\neq 4$

$\boxed{m=1,2,3}$

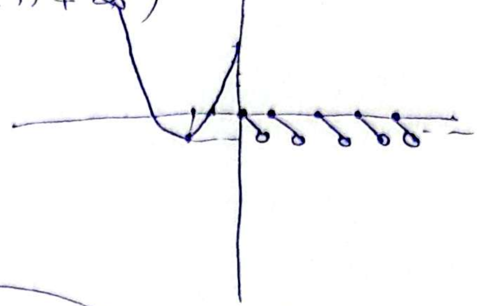
۷-

$$f(x)=\begin{cases} x+2 & x\geq 3 \\ x^2-2x+2 & 0\leq x<3 \\ |x|+2 & x<0 \end{cases}$$

$R_f=[1,+\infty)$



$$f(x) = \begin{cases} x^2+4x+3 & ; x \le 0 \\ [2x]-2x & ; x > 0 \end{cases} \qquad R_f = [-1, +\infty)$$ - 8



$y = a+1-\sqrt{2x+3}$ $\quad (-\infty, a] \cup [b, +\infty) \quad ab = ?$ - 9

$2x+3 \ge 0 \implies x \ge \boxed{-\frac{3}{2} = b} \qquad x = -\frac{3}{2} \implies a+1 = 0 \implies a \ne 1$

$a = 2a + 1$ $\xrightarrow{} 4$

$4 \times -\frac{3}{2} = -\frac{12}{2} = -6$
