هلیا عرب ۲۰

1) $f(x)=\begin{cases} x^2+2x & x\geq a \\ ax-4 & x<a \end{cases}$

$a^2+2a=a^2-4$

$2a=-4 \to a=-2$

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2) $f(x)=\dfrac{x^2+a}{2x-b}$ $\quad g(x)=2x+b$

با $3=4+b$ $\quad b=-1$

با $3=\dfrac{4+a}{4-b}$ (1) $\to a=11$

$f(1)=\dfrac{1+11}{3}=\dfrac{12}{3}=4$

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3) $f(x)=\dfrac{4x+1}{2x^2+ax+b}$ $\quad D_f=R-\{-1,4\}$ ریشه مخرج

$\begin{cases} 2-a+b=0 \\ 32+4a+b=0 \end{cases} \Rightarrow a=-6,\ b=-8$

$f(1)=\dfrac{4(1)+1}{2(1)-6(1)-8}=\dfrac{-5}{12}$

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4) $f(x)=\dfrac{x^3-\sqrt{3}}{-4x^2+ax+b}$ $\quad D_f=R-\{-1\}$

$c(x+1)^2=0$

$-4(x^2+2x+1)=0 \Rightarrow -4x^2-8x-4=0$

$c=-4$ $\quad b=-4,\ a=-8$

$-8-4=-12$

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5) $f(x)=\dfrac{2x}{(x-1)(x^2+mx+1)}$ $\quad D_f=R-\{1\}$

ریشه ندارد (1

(1) $\Delta<0 \Rightarrow m^2-4<0 \Rightarrow m^2<4 \Rightarrow -2<m<2$

(2) $\Delta=0 \Rightarrow m=2$

$[-2,2)$

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6) $f(x)=\sqrt{4-\dfrac{1}{x^2}}$

$4-\dfrac{1}{x^2}\geq 0 \Rightarrow \dfrac{4x^2-1}{x^2}\geq 0$

$-\frac{1}{2}$		0		$\frac{1}{2}$
+		−	−	+

$D_f: (-\infty,-\frac{1}{2}]\cup[\frac{1}{2},+\infty)$

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7) $f(x)=\sqrt{mx^2+2mx+1}$ $\quad mx^2+2mx+1\geq 0$

$a>0$

(2) $m>0 \Rightarrow m=0 \Rightarrow$ (1) ✓

(1) $\Delta\leq 0 \Rightarrow 4m^2-4m\leq 0$

$4m(m-1)\leq 0$

0		1
+	−	+

$[0,1]$

$D_f: [0,1]$

۸) $f(x) = \begin{cases} \frac{4x^2-1}{2x-1} & x \neq a \\ 4x+k & x = \frac{1}{2} \end{cases}$ → پیوسته $\qquad g(x) = 2x+1$

$2a+k = 2$

$k = 0$

$\frac{1}{2} + 0 = \frac{1}{2}$

$2x-1 \neq 0$

$2a-1 \neq 0$

$2a \neq 1$

$a \neq +\frac{1}{2} \Rightarrow a = \frac{1}{2}$

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۹) $f(x) = \begin{cases} \frac{9x^2-4}{6x+2} & x \neq -\frac{1}{3} \\ 2ax+2 & x = \frac{1}{3} \end{cases}$ $\qquad g(x) = 3x+b$

$\frac{9x^2-4}{2x+2} = 3x+b$

$-2a+2 = -2b$ $\quad -2$

$-2a = -6$

$a = +3$

$a-b = 3-(-1)$

(۴)

$(3x-2)(3x+2) = (2x+2)(3x+b)$

$b = -2$

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۱۰) $f(x) = \begin{cases} \frac{x^2-4}{x-2} & x \neq 2 \\ 2a^2+ax & x \geq 2 \end{cases}$ $\qquad g(x) = x+2$

$2a^2+2a = 4$

$a^2+a-2 = 0$

$(a+2)(a-1) = 0$

$a = -2$ ، $a = 1$