(۱

$\Rightarrow$ if $x=a \Rightarrow x^2+2x=ax-4 \Rightarrow a^2+2a=a^2-4$

$2a=-4 \Rightarrow a=-2$

(۲

$f(2)=\frac{4+a}{4-b}=3 \Rightarrow 12-3b=4+a \Rightarrow a=8-3b$

$g(2)=4+b=3 \Rightarrow b=-1 \Rightarrow a=11 \Rightarrow f(11)=\frac{1+11}{2-(-1)}=\frac{12}{3}=4$ ۴

(۳

$\Rightarrow 32+4a+b=0 \Rightarrow b=-32-4a$ / $a-2=-32-4a$

$\Rightarrow 2-a+b=0 \Rightarrow b=a-2$

$5a=-30$

$a=-6$

$b=-8$

$2x^2-6x-8$

$\Rightarrow f(1)=\underbrace{\frac{4+1}{2+(-6)+(-8)}}_{2-14}=\frac{5}{-12}$

(۴

$-4-a+b=0 \Rightarrow b=a+4$

$\frac{-a}{-4}=\frac{a}{4}=-2 \Rightarrow a=-8 \Rightarrow b=-4 \Rightarrow a+b=-8-4=-12$

۵)

$x^2+mx+1 \xrightarrow{x=1} 1+m+1 = 2+m = 0 \Rightarrow m=-2$

$m^2-4<0 \Rightarrow m^2<4 \Rightarrow -2<m<2$

$\Rightarrow m\in[-2,2)$

---

۶)

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

$x^2\geq \frac{1}{4}$

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

$x\leq \frac{-1}{2}$

$x\neq 0$

$D_f: \mathbb{R}-\left(\frac{-1}{2},\frac{1}{2}\right)$

---

۷)

$mx^2+2mx+1\geq 0$

$4m^2-4m\leq 0 \rightarrow$ $+\ \ 0\ \ -\ \ 1\ \ +$

if $m\in(0,1) \rightarrow mx^2+2mx+1 \Rightarrow$ همواره مثبت

if $m\in\{0,1\} \rightarrow mx^2+2mx+1 \Rightarrow$ ریشه مضاعف دارد

بنابراین نامنفی خواهد بود.

$\Rightarrow 0\leq m\leq 1$

---

۸)

~~$\frac{(2x-1)(2x+1)}{(2x-1)}$~~ $= 2x+1$ ، $2a+1$

$x=\frac{1}{2} \rightarrow 2+k=2 \Rightarrow k=0 \Rightarrow a=\frac{1}{2}$

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

(9

$$\frac{(3x-2)(3x+2)}{(3x+2)} \div 3x-2 \; ; \; x \neq -\frac{2}{3}$$

$$3x\frac{-2}{3}xa+2 = -2a+2$$

$$\because 3x-2 = 3x+b \therefore b = -2$$

$$\Rightarrow -2a+2 = -2-2 \Rightarrow -2a+2 = -4$$

$$-2a = -6 \therefore a = 3$$

$$\Rightarrow a-b = 3-(-2) = 5$$

(10

$$\frac{x^2-4}{x-2} = \frac{(x-2)(x+2)}{(x-2)} \times x+2$$

$$2a^2+2a = 2+2 \Rightarrow 2a^2+2a = 4$$

$$\Rightarrow a^2+a = 2 \therefore a^2+a-2 = 0$$

$$\Rightarrow (a+2)(a-1) \begin{cases} a=1 \\ a=-2 \end{cases}$$