۱_ $x^2+2x=ax-4 \xRightarrow{\text{if } x=a} a^2+2a=a^2-4 \Rightarrow 2a=-4 \Rightarrow a=-2$

۲_ $g(x)=2x+b \xrightarrow{x=2} 3=4+b \Rightarrow b=-1$

$\Rightarrow f(x)=\dfrac{x^2+a}{2x-b} \Rightarrow 3=\dfrac{4+a}{5} \Rightarrow a=11$

$f(1)=\dfrac{1+11}{2-(-1)}=\dfrac{12}{3}=4$

۳_ $2-a+b=0$, $32+4a+b=0 \Rightarrow -a+b=-2$, $4a+b=-32 \Rightarrow a-b=2$, $4a+b=-32$

$5a=-30 \Rightarrow a=-6 \,,\, b=-8$

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

۴_ $-4(-1)^2+a(-1)+b=0 \Rightarrow -4-a+b=0 \Rightarrow a-b=-4$

$\Delta=0 \Rightarrow a^2+16b=0 \Rightarrow$ $16a-16b=-64$, $a^2+16b=0$

$a^2+16a=-64 \Rightarrow a^2+16a+64=0 \Rightarrow (a+8)^2=0$

$\Rightarrow a=-8 \,,\, b=-4$

$a+b=-8-4=-12$

۵_ $x^2+mx+1 \xrightarrow{\Delta<0} m^2-4<0 \Rightarrow (m-2)(m+2)<0$

$\Rightarrow$
	-2		2	
$+$	0	$-$	0	$+$

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

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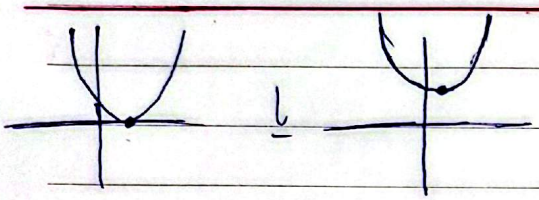
۶- $\frac{1}{4x^2} > 0 \Rightarrow 4x^2 - 1 > 0 \Rightarrow (2x-1)(2x+1) > 0$

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

$+\phi - \phi +$

$\Rightarrow \mathbb{R} - [-\frac{1}{2}, \frac{1}{2}]$

۷- 

$a > 0 \Rightarrow m > 0$ I

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

$\Delta < 0 \Rightarrow 4m^2 - 4m < 0 \Rightarrow 4m(m-1) = 0 \Rightarrow +\phi - \phi + \Rightarrow m \in (0,1)$ III

$\Rightarrow \bigcap_{I \cap II \cap III} = m \in [0,1]$

۸- $\frac{4x^2 - 1}{2x - 1} \Rightarrow 2x - 1 \neq 0 \Rightarrow 2x \neq 1 \Rightarrow x \neq \frac{1}{2} \Rightarrow a = \frac{1}{2}$

$4x + k = 2x + 1 \xrightarrow{x=\frac{1}{2}} 2 + k = 2 \Rightarrow k = 0 \qquad a + k = \frac{1}{2} + 0 = \frac{1}{2}$

۹- $2a^2 + am = x + 2 \rightarrow 2a^2 + 2a = 4 \rightarrow a^2 + a = 2$

$a^2 + a - 2 = 0 \rightarrow (a+2)(a-1) < \begin{matrix} a=-2 \\ a=1 \end{matrix}$

۱۰- $x = -\frac{5}{2} \rightarrow -2a + 2 = -2 + b \rightarrow -2a - b = -4$

$\rightarrow -2a + 2 = -4 \Rightarrow -2a = -6 \Rightarrow a = 3$

$x = -1 \rightarrow -a = -2 + b \rightarrow b = -2$

$-2 - (-2) = 0$

AZAD