Question 4980:

Find the $\mathrm{Re(z)}\ of\ \dfrac{\log(z+4)}{z^2+i}$

So, we have $F(z)=\dfrac{\log(z+4)}{z^2+i}$. Lets multiply and divide this function by z^2-i (this is the conjugate of the denominator), to have the complex part only in numerator (we know that $(a-b)(a+b)=a^2-b^2\,;\, i^2=-1$):

$$F(z)=\frac{\log(z+4)\cdot(z^2-i)}{(z^2+i)\cdot(z^2-i)}=\frac{\log(z+4)\cdot(z^2-i)}{z^4+1}$$

Hence,

$$\mathrm{Re}(F(z))=\log(z+4)\cdot\frac{z^2}{z^4+1}$$