Step-1

Given that the multiplications of two complex numbers

$(a+ib)(c+id)=(ac-bd)+i(bc+ad)$, involves four separate multiplications *ac, bd, bc, ad.* Ignoring *i*, we have to verify that can we compute $ac-bd$ and $bc+ad$ with only three multiplications.

Step-2

The first term $ac-bd$ can be calculate as $(a-b)(c+d)-ad+bc$

It consist only one additional multiplication.

The second term $bc+ad$ can be calculate as $(a+b)(c+d)-ac-bd$

It consist only one additional multiplication.

So we can compute $ac-bd$ and $bc+ad$ with only three multiplications.