Answer on Question #52950 – Math – Complex Analysis

does multiplication of two imaginary numbers imaginary or real? if i multiply 2i and 3i then it is = -6 which is real .if √-3 and √-2 are multiplied then it gives - √6 which is real . but if i do the same thing like this √-3 * √-2 =√{(-3)*(-2)} =√6 which is also real . so why the ans is -√6 . we know multiplication of two complex numbers is a complex number . if i write 2i as (0+2i) and 3i as (0+3i) and then multiply these two should come a complex number as definition . but why it's real?

Solution

$(i)^2 = (-i)^2 = -1 \ so \ \sqrt{-1} = \pm i.$

Thus $\sqrt{-3} = \pm i\sqrt{3}, \ \sqrt{-2} = \pm i\sqrt{2}$

and $\sqrt{(-3)(-2)} = \left(\pm i\sqrt{3}\right)\left(\pm i\sqrt{2}\right) = \pm(i)^2\sqrt{6} = \pm\sqrt{6}.$

Every real number is a complex number with imaginary part equal to 0.

$(0 + 2i)(0 + 3i) = 0 * 0 - 2 * 3 + (0 * 2i + 0 * 3i) = -6 + 0i$

So we have the complex number with imaginary part equals 0, i.e. the real number.