

2 About Homework 2:

Problem 1.34 (i). It's not your fault. I don't agree with the back of the book. If the problem were "Find $1/z$ " the right approach would be to take $1/z = \bar{z}/z\bar{z}$. However, since it already gave you the answer, to *prove* that it is correct you should *multiply* the expression by z and verify that you get 1:

$$(a + ib) \left(\frac{a}{a^2 + b^2} - i \frac{b}{a^2 + b^2} \right) = \text{blah blah} = 1$$

Problem 1.36 (i). This problem is misleadingly worded. There are no "positive" or "negative" complex numbers so every nonzero complex number has two square roots. De Moivre's formula is only for *positive integer exponents* n .

(No joke.) The number i is an imaginary number whose square is -1 . It is one of the two square roots of -1 . The other is $-i$.

The answer (for the purpose of doing *abstract algebra*) is:

$$\sqrt{8 + 15i} = \pm \left(\frac{5\sqrt{2}}{2} + i \frac{3\sqrt{2}}{2} \right)$$

Problem 1.36(ii). According to the previous problem, if you find one fourth root, the other fourth roots are given by multiplying by i , -1 and $-i$.