

Phys 3010 Mathematical Physics

Assignment 3

You should be able to do all of these questions by hand. However, feel free to use Maple to check the answers.

1. What is $1/(9-12i)$?
2. What is $1/(6+2i)^2$?
3. What is $(3+2i)/(9-12i)$?
4. Convert $12-5i$ to polar notation (Hint: there is no unique solution to this question.)
5. What is $\sqrt{12-5i}$? (Hints: there are two possible solutions, and use the result of the previous question.)
6. What is $\sqrt[3]{12-5i}$? (Hint: there are three possible solutions)
7. Convert $5e^{i\pi/6}$ to Cartesian notation.
8. If $z = (12-5i)/13$, find all the possible values of z^{1+i} . (Hint: start by taking the logarithm of both sides, and there are multiple solutions. Maple does not seem to find them all.)
9. What is $\ln(z)$? (z defined in previous equation)