Math 419 HW #1

1. (Jones Problem 1–1) Let a, b, c be three distinct complex numbers. Prove that these numbers are the vertices of an equilateral triangle if and only if

$$a^2 + b^2 + c^2 = ab + bc + ca.$$

(*Hint:* First show that translating a, b, and c does not change the geometric situation, nor does it change the equation. Then show the same for multiplying by a non-zero complex number. Think about how to use these two operations to eliminate some variables.)