1 Completing the triangle

Why is it true that $a + b > c$?
Since a, b and c are the lengths of the sides of the triangle, they are all positive numbers. We also know that $a^2 + b^2 = c^2$. So, $a + b = \sqrt{(a+b)^2} = \sqrt{a^2 + 2ab + b^2} = \sqrt{c^2 + 2ab} > \sqrt{c^2} = c$.