Question 3. Let $a \leq b \leq c$ be the lengths of the sides of a triangle. If $a^2 + b^2 < c^2$, then prove that Δ is obtuse angled.

Solution.

$$a^2 + b^2 < c^2$$
$$\Rightarrow a^2 + b^2 < a^2 + b^2 - 2ab \cos C$$
$$\Rightarrow \cos C < 0$$
$$\Rightarrow C \text{ is obtuse}$$