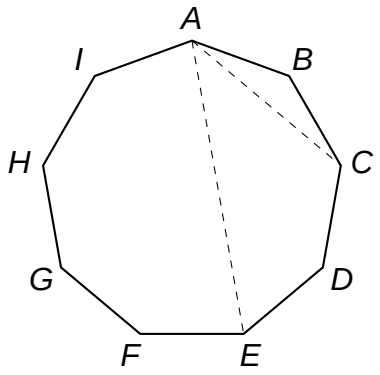
[redacted]

Senior Questions

1. Prove that the di erence between the longest and the shortest diagonal of a regular nonagon is equal to the length of the side.



2. There are ve distinct real positive numbers. It is known that the total sum of their squares and the total sum of their pairwise products are equal.

   (a) Prove that we can choose three numbers such that it would not be possible to make a triangle with side lengths equal to these numbers.

   (b) Prove that the number of ways to form the triples satisfying (*a*) is at least six (triples which consist of the same numbers in di erent order are considered the same).