Problem 5 Sum of Two Integers

S is a set of distinct positive integers such that:

$S \subset \{1, ..., n\}$ and $|S| > \frac{n}{2} + 1$

Prove that there exist 3 distinct integers a_i, a_j and a_k such that:

$a_i, a_j, a_k \in S$ and $a_i + a_j = a_k$.