MATH 113: DISCRETE STRUCTURES
WEDNESDAY WEEK 5 HANDOUT C

Problem 1. Let n be the integer handed to you by your second team member for Problem 1. Place the n equally spaced chairs around a circular table. How many guests must sit at the table in order for you to be certain that two of them are sitting directly across from each other (without looking at the table)?

Problem 2. Let n be the integer handed to you by your second team member for Problem 2 and let $k = \lfloor n/9 \rfloor$. A binary operation on a set S is a function $S \times S \to S$ (where $S \times S = \{(a, b) \mid a, b \in S\}$ is the Cartesian product of S with itself). If $|S| = k$, how many binary binary operations are there on S?