In the following problem, calculate the number of different “words” that can be obtained by rearranging the letters of the given word. (“Words” don’t have to make sense.)

Problem 1. *(i) "CARAVAN"*

(ii) "CLOSENESS"

(iii) "MATHEMATICAL"

Problem 2. *How many diagonals are there in a convex n-gon? (“Convex” means that any line segment joining any two points of the figure lies entirely inside the figure.)*

Problem 3. *A 17-digit number is chosen, and its digits are reversed, forming a new number. These two numbers are added together. Show that their sum contains at least one even digit.*

Problem 4. *How many ways are there to put one white and one black King on a chessboard so that they do not attack each other?*

Problem 5. *How many six-digit numbers have all digits of equal parity (all odd or all even)?*

Problem 6. *Do the seven-digit numbers with no digits of 1 in their decimal representations constitute more than half of all seven-digit numbers?*

Problem 7. *How many nine-digit numbers have an even sum of their digits?*