Class 8 Homework August 12, 2023 Name_____

1. There are 11 real numbers a1, a2, to a 11, and 0 <= ai (I = 1, …, 11) <= 1. Please prove at least the absolute difference of two numbers would be less than 1/10.

2. There are 10 natural numbers from 1 to 10. Please prove: if selecting any 6 numbers from the 10 numbers, there must be 2 numbers of the 6 numbers, one number is the other number's multiple.

3. How many lines can you draw using 5 non collinear (not in a single line) points A, B，C, D and E on a plane?

4. How many 4 digit numbers can you make using the digits 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 without repeating the digits?

5. We need to form a team of 5 students in a class of 20 students. How many different teams can be formed?

6. In how many ways can you arrange 7 different books on a shelf?

7. How many triangles can you make using 6 non collinear points on a plane?

8. In a certain country, the car number plate is formed by 3 digits from the digits 1, 2, 3, 4, 5, 6, 7, 8 and 9 followed by 3 letters from the alphabet. How many number plates can be formed if neither the digits nor the letters are repeated?

9. A committee including 5 boys and 4 girls is to be formed from a group of 10 boys and 12 girls. How many different committees can be formed from the group?

10. Out of 8 consonants and 5 vowels, how many words of 3 consonants and 2 vowels can be formed?

11. A coin is tossed 5 times. Find out the number of possible outcomes.

When a coin is tossed once, there are two possible outcomes: Head (H) and Tail (T). Hence, when a coin is tossed 5 times, the number of possible outcomes =2 x 2 x 2 x 2 x 2=32. (The possible outcomes are HHHHH, HHHHT, HHHTT, HHTTT, HTTTT, HHHTH, …… TTTTT)