

Mathematics for Science
Assignment 10
Introduction to permutations
Lecturer: Kahenya, N.P

Instructions: Attempt all the Questions

- 1) Evaluate; $19!$; $12!$; $\frac{8!}{9!}$; $\frac{32!}{33!}$
- 2) Evaluate $p(n, r)$;
 - (i) $p(12, 5)$
 - (ii) $p(17, 11)$
 - (iii) $p(9, 2)$
- 3) Show that $p(n, n) = n!$
- 4) In how many different ways can a group of 11 boys be arranged in a row?
- 5) Determine how many 4-digit codes can be formed from the numbers 1, 2, 3, and 4 if;
 - (i) Each number is used only once in each code.
 - (ii) If repetition of number is allowed.
- 6) Four boys and 3 girls are seated on a bench. Two of them are brother and sister. Determine in how many ways can they be seated if the siblings must sit together.
- 7) Twenty boys are racing. In how many different ways can the first 3 positions be won?
- 8) Find how many ways can 4 red pencils, 3 yellow pencils, and 2 black pencils be arranged in a row if the pencils of the same colour are indistinguishable.
- 9) The letters of the word AVOCADO are arranged in a row. Find;
 - (i) How many different ways can the letters be arranged.
 - (ii) How many ways can the letters be arranged if the two A's are together.
 - (iii) How many ways can the letters be arranged if the two A's and the two O's must be together.