

S.5 SUBSIDIARY MATHEMATICS HOLIDAY WORK

PERMUTATIONS AND COMBINATIONS

Use the following references to study about the above topic and answer the given questions.

REFERENCES

- Understanding Pure Mathematics, A.J Sadler
- Pure Mathematics 1 J.K Backhouse
- <https://chatgpt.com/share/673ddc97-45cc-8011-a111-dc6c218ad6ab>
- https://www.youtube.com/watch?v=wL5Y_eZd1Xg

1. a) How many arrangements can be made using the letters in the word “TROTting”?
b) In how many of these arrangements are the letters N and G next to each other?
2. Three letters are chosen at random from the word CLOTHINGS. Determine the probability that two of the three letters chosen are consonants.
3. A father and a mother with their five children are to sit on a bench. What is the probability that the father and mother will sit next to each other?
4. A students’ council consists of 7 girls and 5 boys. Two students are selected at random from the council. Find the probability that;
a) both are girls
b) the first is a boy and the second is a girl.
5. A committee of 5 is to be formed from a group of 6 men and 7 women
a) Find the number of possible committees
b) What is the probability that there are only 2 women on the committee?

Use the graph book for question 6

6. The manager of a cinema wishes to divide the seats available into two classes executive and ordinary. There are not more than 120 seats available. There must be at least twice as many ordinary seats as there are executive seats. Executive seats are priced at shs15,000 each. Ordinary seats are priced at Shs10,000 each. At least Shs1,000,000 should be collected at each show to meet the expenses.
a) Taking x as the number of executive seats and y as the number of ordinary seats, write down five inequalities from the given information.
b) Represent the inequalities on a graph.
c) Find the number of seats of each kind which will give the maximum profit and calculate this maximum profit.
d) Find the least number of seats that must be sold in order to incur no loss.