



IGCSE Additional Mathematics Ch 13

Perms + Combs Test

Student Name:

Time allowed: 40 minutes

READ THESE INSTRUCTIONS FIRST

Write in dark blue or black pen.

You may use a soft pencil for any diagrams or graphs.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** the questions.

Write your answers on the separate Answer Booklet/Paper provided.

Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.

The use of an electronic calculator is expected, where appropriate.

You are reminded of the need for clear presentation in your answers.

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 26.

1.

- (a) 7 boys are to be seated in a row. Calculate the number of different ways in which this can be done if 2 particular boys, Andrew and Brian, have exactly 3 of the other boys between them. [4]
- (b) A box contains sweets of 6 different flavours. There are at least 2 sweets of each flavour. A girl selects 3 sweets from the box. Given that these 3 sweets are not all of the same flavour, calculate the number of different ways she can select her 3 sweets. [3]

2.

- (a) How many different four-digit numbers can be formed from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9 if no digit may be repeated? [2]
- (b) In a group of 13 entertainers, 8 are singers and 5 are comedians. A concert is to be given by 5 of these entertainers. In the concert there must be at least 1 comedian and there must be more singers than comedians. Find the number of different ways that the 5 entertainers can be selected. [6]

3.

An artist has 6 watercolour paintings and 4 oil paintings. She wishes to select 4 of these 10 paintings for an exhibition.

- (i) Find the number of different selections she can make. [2]
- (ii) In how many of these selections will there be more watercolour paintings than oil paintings? [3]

4.

A badminton team of 4 men and 4 women is to be selected from 9 men and 6 women.

- (i) Find the total number of ways in which the team can be selected if there are no restrictions on the selection. [3]

Two of the men are twins.

- (ii) Find the number of ways in which the team can be selected if exactly one of the twins is in the team. [3]