Worksheet F: More arrangements – practice questions

**Practice questions 1**

In the English language, the letters A, E, I, O, U are vowels.

All other letters are consonants.

**1** Find the number of ways all 8 letters of the word AVOCADOS can be arranged if:

(i) there are no restrictions

(ii) the first letter is O and the last letter is O

(iii) all the Os are together.

**2** Find the number of different ways the 10 letters of the word BREADBOARD can be arranged in a line if:

(i) there are no restrictions

(ii) all the vowels are next to each other.

**3** Find the number of ways the 11 letters of the word MISSISSIPPI can be arranged

(i) if all the letters I are together

(ii) if M is at one end and a P is at the other end.

**Extension questions**

**4** Find the number of ways in which all 9 letters of the word AMARANTHS

can be arranged in each of the following cases:

(i) the N, T and H are together

(ii) the letter M is in the middle and each end is occupied by one of the other consonants.



**5** Five fair tetrahedral dice, marked 1, 2, 3, 4 are rolled.

They are then placed in a line.

Find the number of possible arrangements where the

difference between the score on the first dice and the last dice in the line is 2.

Worksheet F: More arrangements – practice questions continued

**Practice questions 2**

**1** Find the number of different ways that 6 different black cows and 4 different white cows can stand in a line if:

(i) all 6 black cows are next to each other

(ii) no white cow is next to another white cow.

**2** A quiz team consists of 1 girl and 5 boys. In how many different ways can the team members be arranged in a line if the girl is not at either end?

**3** Find the number of different ways of arranging all nine letters of the word

ALLOWABLE if

(i) there are no restrictions

(ii) no vowel is next to another vowel.

**4** A cycle rack has space for 10 cycles, arranged in a line. On one day, there are 3 different cycles stored in randomly chosen positions and 7 empty spaces.

(i) Find the number of possible arrangements of the 3 cycles in the rack.

(ii) Find the number of arrangements where the 3 cycles are not next to each other.

**Extension question**

**5** The diagram shows the 15 passenger seats in a bus.

Front

Back

Eight people get on the bus, Mr and Mrs Brown, Mr and Mrs Green, 3 students and a policeman.

(i) How many possible seating arrangements are there for the 8 people?

(ii) The 3 students sit in the back row. The policeman sits in a single seat. Mr and Mrs Brown sit in the two seats directly in front of the students. Mr and Mrs Green sit next to each other. How many possible seating arrangements are there?