# Probability test [1h]
# Monday 4 December

8 An urn contains two red balls marked R1 and R2 and two black balls marked N1 and N2. All are indistinguishable by touch. We draw a first ball at random and we do not put this ball back in the urn. A second ball is drawn at random from those remaining in the urn.

1° Complete the tree which illustrates the two successive draws.

**First ball drawn**

**Second ball drawn**

2° Define E to be the event: "*we drew two red balls*". What is the probability of event E?

3° Define F to be the event: "*two balls bearing the same number were drawn*". What is the probability of event F?

9 A bag contains 3 red tokens that are indistinguishable by touch numbered 1 to 3. We draw a token at random from this bag and write down its number.

A second bag contains 4 blue tokens indistinguishable by touch numbered from 1 to 4. We draw a token at random from this bag and write down its number.

We then constitute a whole number of two digits whose tens digit is written on the red token and whose units digit is written on the blue token.

Example: 2[red] 4[blue] which gives the number 24.

1° We call A the event: "*the number obtained is a multiple of 2*". What is the probability of A?

2° We call B the event: "*the number obtained is a multiple of 3*". What is the probability of B?

3° We call C the event: "*the number obtained is a multiple of 2 and 3*". What is the probability of C?

4° We call D the event: "*the number obtained is a multiple of 5*". What is the probability of D?

10 Two perfectly balanced wheels are rotated simultaneously. On each, the four sectors are numbered from 1 to 4. When they stop, we note the number located in front of the arrow, then we calculate the sum of numbers obtained.

**Part A** We simulate 100 results with a spreadsheet. The following graph gives the relative frequency of appearance of each sum obtained.

**[on the ordinate axis] Relative frequency (%)**

**[on the abscissa axis] Sum of the numbers read on the wheels**

1° By reading graphically, give the frequency of appearance of the sum 3.

2° What can we say about the frequency of appearance of the sum 1?

**Part B** We want to determine the probability of each possible sum.

1° Complete the opposite double entry table.

[top] First wheel [left, vertically] Second wheel

2° How many throws of the two wheels give a sum equal to 5? What is the probability of the event: "*the sum obtained is equal to 5*"?

3° Complete the table giving the probability of each possible sum.

**Sum obtained**

**Probability**

4° Compare these probabilities and the relative frequencies provided by the simulation of the part A.

5° What is the probability of obtaining a prime number?