



# PROBABILITIES

## EXERCISES SHEET

### Exercise 1

We throw a fair dice with 10 faces numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, 0.

1. Complete:

There are ..... chances out of ..... to throw a 7.

There are ..... chances out of ..... to throw an odd number.

2. What is the probability of throwing a 7?
3. What is the probability of throwing an odd number?

### Exercise 2

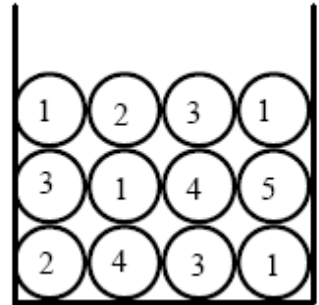
A fair coin is tossed

1. Draw a tree diagram for the different outcomes, with their probabilities.
2. An opaque urn contains two red balls and two green balls. A ball is randomly taken from the urn. Draw the tree diagram with the probabilities.
3. Imagine a random experiment with a lottery wheel which has the same tree as that obtained in 1.

### Exercise 3

A ball is randomly picked from the urn opposite (ie each ball has the same probability of being picked).

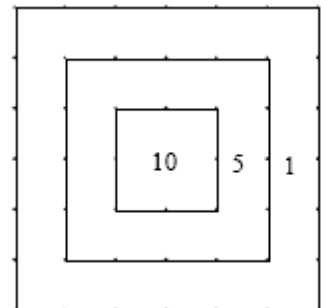
1. What is the probability of picking a:  
 1?..... 2? ..... 3?.....  
 4?..... 5?.....
2. What is the probability of not picking a 1?
3. What is the probability of picking a ball with an even number?



### Exercise 4 :

Imagine that someone shoots randomly on the target opposite, without ever missing it (!). All the squares are concentric and their sides measure  $a$ ,  $2a$  and  $3a$ .

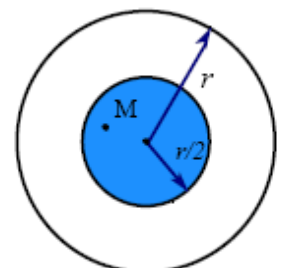
1. What is the probability that he gets 10 points? 5 points? 1 point?
2. What is the probability that he gets 5 or more points ?



### Exercise 5 :

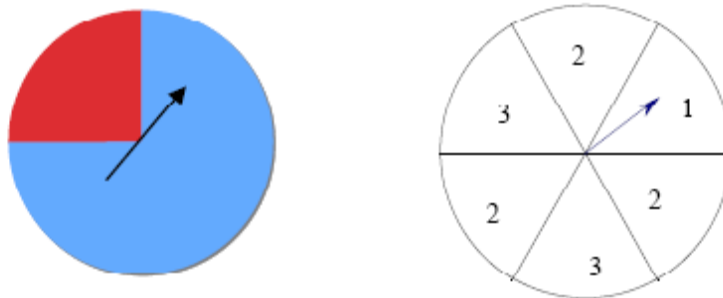
Let  $M$  be an aeroplane which appears randomly on the circular screen of a radar, radius  $r$ .

What is the probability that it appears in the coloured zone, a disc of radius  $r/2$ ?



### Exercise 6 :

Consider the following game, which takes place in 2 stages: first turn the lottery wheel on the left, then the one on the right.



The possible results can be written as (R ; 1) (R ; 2) etc ...

**Calculate the probability of each outcome.**

### Exercise 7 :

At the start of a school year, 25 students in 3<sup>ème</sup> are asked their age: 48% are 14,  $\frac{1}{5}$  are 16 and the others are 15.

1. One pupil is chosen randomly and asked his age. Draw a tree diagram of the different outcomes, showing their probability.
2. During the survey, the pupils are also asked if they use a back pack or a satchel:
  - $\frac{1}{6}$  of 14 year old pupils have a back pack
  - $\frac{3}{8}$  of 15 year old pupils have a satchel
  - 60% of 16 year old pupils have a backpack.
3. A pupil is chosen randomly and asked his age and what type of school bag he uses.
  - a) Using 1. above, draw up a tree diagram showing the different outcomes and their probabilities.
  - b) Calculate the probability of the following events:
    - A: "The pupil is 14 and has a back pack"
    - B: "The pupil is 15 and has a back pack"
    - C: "The pupil is 16 and has a back pack".

From this, deduce the probability that the pupil chosen randomly has a back pack.