

**BACCALAURÉAT GENERAL
EPREUVE SPECIFIQUE DES SECTIONS EUROPENNES
MATHEMATIQUES – ANGLAIS**

SUJET 20

Fixing the odds

Ce sujet comporte deux pages. L'usage de la calculatrice, avec ou sans mode examen, est autorisé.

How to use probability to your advantage? Remember life is a game of probability.
Your chances of succeeding go down with every competitor.
I believe everything in life is guided by probability.

It's simple; drive a car without a seatbelt and you're unlikely to survive a crash. But
put the seatbelt on and your chances for survival instantly go up 50%.

Have healthy friends and you're likely to remain in healthy shape. But have an obese
friend and your chances of becoming obese go up 57%

Adapted from an article by Richard Reis, March 15, 2017

I) Explain what the text deals with and comment on it.

II) Exercises

Let's consider this game:

You have two bags, four red balls and four white balls. You must put all the balls in the bags without leaving one bag empty.

Your friend chooses a bag at random and then chooses a ball at random from that bag. We are going to look at the probability that your friend chooses a red ball.

Part 1 :

You decide to put three red balls and two white balls in the first bag and the rest of the balls in the second bag.

- 1) Illustrate the situation with a probability tree.
- 2) What is the probability that your friend chooses a red ball?
- 3) What is the probability that your friend chooses the first bag knowing that he chooses a red ball?

Part 2 :

- 1) How should you fill the two bags with balls to make the probability that your friend will choose a red ball as small as possible?
What will be the probability in that case?
- 2) Same question if you want to make the probability of choosing a red ball as large as possible.