

**BACCALAURÉAT GENERAL**  
**EPREUVE SPECIFIQUE DES SECTIONS EUROPENNES**  
**MATHEMATIQUES – ANGLAIS**  
**CORRIGÉ DU SUJET 20**

Part A :

1. On the first level of the tree, the probabilities are 0.5 for each bag.  
If the chosen bag is the first one, the probability to choose a red ball is 0.6 (3/5) and if the chosen bag is the second one, the probability to choose a red ball is 1/3.
2. The probability to choose a red ball is then  $(3/5) \times (1/2) + (1/3) \times (1/2) = (7/15)$
3. It is a conditional probability :  $(1/2) \times (3/5) / (7/15) = (9/14)$

Part B :

1. The solution is to put all the balls into one bag.  
 $P(\text{red}) = 1/2 (1/2) + 1/2 (0) = 1/4$ .
2. The solution here is to put no white balls and add just one red in one bag, then the probability of choosing that bag and a red from it is  $1/2$  which is maximal. In order to make the probability of choosing a red from the other bag as large as possible we put as many red ones in that bag as possible, which means putting exactly one red and no white ones in the first bag and all the remaining balls in the second bag. With 4 red and 4 white balls the probability of selecting a red ball is then :  $(1/2) \times 1 + (1/2) \times (3/7) = 5/7$ .
3. With 100 white balls and 100 red balls, the solution to the first problem is the same with a probability of  $1/4$  and the solution to the second problem is also the same but with a probability of:  $(1/2) \times 1 + (1/2) \times (99/199) = 149/199$