

Subject n°17

PROBABILITIES

*Please, do not write on the exam paper
and do not forget to give it back at the end of the test.*

Playing darts



Pamela is in a pub with two friends Kimberley and Jack. They want to play darts. Her friend Kimberley challenges her saying:
“Pamela, for sure, you're a better player than us so, in order to enhance fairness, would you agree to play three games with Jack and I as alternate opponents? If you win two games in a row*, we'll buy you dinner, but if you lose, you'll pay fish and chips for everyone.”
Pamela answers: “Whom do I play first, you or Jack?”
“You may have your choice”, answers Kimberley, her eyes twinkling.

Pamela knows that Jack plays a stronger game than Kimberley. In fact, her probability of success against Jack is equal to $\frac{3}{5}$ whereas her probability of winning against Kimberley is $\frac{4}{5}$.

- 1) Sketch the situation with two trees :
 - * Tree 1 : she first plays Kimberley, then Jack, then Kimberley again .
 - * Tree 2 : she first plays Jack, then Kimberley, then Jack again.
- 2) Can Pamela maximize her chance by choosing her first opponent ?
- 3) Would the result be any different if, instead of having to win two games in a row, Pamela was declared the winner by winning two games (in a row or not)?
- 4) Have you ever played darts ? Do you know the origin of this game ?

*In a row : d'affilée