

**BACCALAURÉAT GÉNÉRAL ET TECHNOLOGIQUE
ÉPREUVE SPÉCIFIQUE DES SECTIONS EUROPÉENNES
MATHÉMATIQUES – ANGLAIS**

SUJET 20

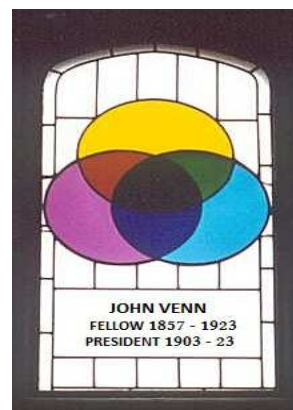
Thème : Logic and Probabilities

Ce sujet comporte 1 page. L'usage de la calculatrice est autorisé.

Venn Diagram

Cambridge University is a place of long memories. John Venn, inventor of the diagram which bears his name, was born near Hull, on the east coast of England, on 4 August 1834 and entered Gonville and Caius College in the university as long ago as 1853.

- 5 "I began at once somewhat more steady work on the subjects and books which I should have to lecture on. I now first hit upon the diagrammatical device of representing propositions by inclusive and exclusive circles. Of course the device was not new then, but it was so obviously representative of the way in which any one, who approached the subject
- 10 from the mathematical side, would attempt to visualise propositions, that it was forced upon me almost at once."



Stain glass window in
Caius College, Cambridge

The Story of Venn Diagrams, A. W. F. Edwards and Ian Stewart, 2004

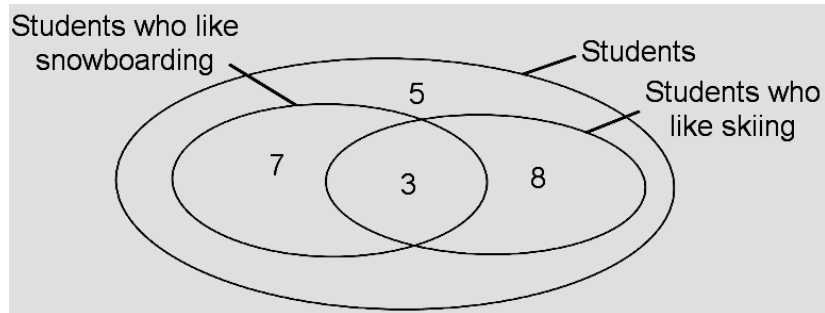
One of the most important promoter of Venn diagrams was Charles Lutwidge Dogson (1832-1898) in *Symbolic logic* (1888), so far from its famous *Alice's adventures in Wonderland* (1865)...

Definition: A Venn diagram is a diagram that shows all possible logical relations between a finite collection of different sets.

- I. Dégager les idées essentielles du texte ci-dessus.

II. Exercice

1. a. Explain the meaning of each number in the Venn diagram below.



- b. How many students are there in this group?

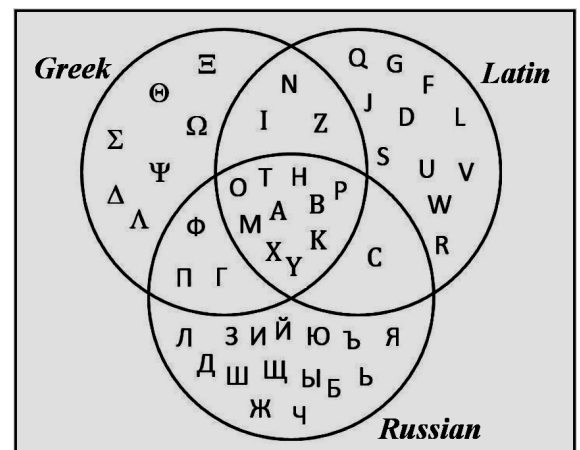
2. This Venn diagram shows overlapping sets containing the 48 letters of three alphabets: Greek, Latin and Russian.

We randomly pick a letter among these three alphabets. We notice the events as followed:

R: "the letter comes from the Russian alphabet"

L: "the letter comes from the Latin alphabet"

G: "the letter comes from the Greek alphabet."



- a) Work out $p(R \cap L)$ and $p(R \cap L \cap G)$.

- b) Work out $p(R \cup L)$ and $p_L(R)$.