

# BACCALAURÉAT-Session 2015

## Epreuve de Discipline Non Linguistique

### Mathématiques/Anglais

#### THE ISLAND OF HELPUSELPH

A settler in the island of Helpuselph applied to the Governor for some land. "How much would you like?" asked the Governor. "About 100 square miles." "Okay," said the Governor. "You may choose a rectangular parcel of land in the township of Little Rainfall. Its dimensions must be such that, if one side of the rectangle were 5 miles longer, and the other 4 miles longer, the area of the rectangle would be twice as great; and its perimeter must be exactly 46 miles." The applicant duly selected and fenced his land in accordance with these conditions. But he got away with six square miles more than the Governor had anticipated.

Taken from *My Best puzzles in Mathematics*, by Hubert Philips.

#### Questions :

1. Make a short presentation of the text.
2. a) Prove that solving the problem is the same as solving the following system, where  $a$  and  $b$  are the two unknown lengths :
$$\begin{cases} a + b = 23 \\ a \times b = 4a + 5b + 20 \end{cases}$$
  - b) Hence show that solving this system relies on solving  $a^2 - 24a + 135 = 0$ .
  - c) What was the value that the Governor had in mind?
3. What do you know about the system of units used in the United Kingdom? Do you think it is still useful to keep both imperial and metric system nowadays ?