

**Please do not write on this document, and do not forget to hand it back to the jury at the end.**

## **SEQUENCES**

Let us solve the following problem in an English nursery rhyme:

**As I was going to St. Yves,  
I met a man with seven wives;  
Every wife had seven sacks,  
Every sack had seven cats,  
Every cat had seven kits,  
A man, kits, cats, sacks, and wives,  
How many people did I meet?**

1. Solve the problem in this rhyme. Do think to explain your working out.

**NB:** here “people” corresponds to any element which can be counted.

2. If the rhyme was to be pursued, which geometric progression would we get?  
Give its characteristics.  
Give the expression of  $(u_n)$  in terms of  $n$ .

**Nota:** rhyme means “comptine”

**kits means “chatons”.**