

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

**SUJET 19 - Student accommodation: what you need to know**

**Thème : Sequences**

**Ce sujet comporte 2 pages. L'usage de la calculatrice est autorisé.**

If A-level results mean your child has a confirmed place at university, the next task is to make sure their first-year accommodation is sorted out.

**Where do university students live during term-time?**

- 43% in privately rented houses or flats
- 5 27% in parental home
- 19% in halls, flats or houses run by university or college
- 6% in own home
- 4% in privately owned halls of residence

**Expenses not included in the rent**

- 10 Always check what is included in your hall costs. Extras can include, for example, a university bus pass, access to a gym or a regular cleaner. The vast majority of student accommodation rents include gas and electricity costs. In contrast, car parking is nearly always an add-on cost. Internet costs are included in the rents of 91% of private providers and 82% of institutions.
- 15 To secure an accommodation place, you may have to pay extras in the form of booking fees and deposits. Deposits are increasingly used and are getting higher, according to the NUS\*, which reports that 65% of providers require a deposit. The average deposit required by a private provider is £300.

Abridged from *The Guardian*, 17 August 2013

1. Read the beginning of the text up to "halls of residence"
2. Report on what you understood from the text

\* NUS = National Union of Students

## **Exercise**

A student wants to rent a private room for a period of three years.

He or she is offered two types of contracts:

- First contract: the rent is £340 the first month and it will increase by 1.5% per month until the end of the 3-year contract.
  - Second contract: the rent is £350 the first month and it will increase by £4 per month until the end of the 3-year contract.
1. Calculate the rent (in pounds) the student will have to pay the second month if he or she chooses the first contract and then if he or she chooses the second contract.
  2. Let's consider the sequence :  $u_{n+1} = 1.015u_n$  and  $u_1 = 340$ 
    - a. Justify that  $u_n$  is the rent (in pounds) after  $n$  months if the student chooses the first contract.
    - b. What kind of sequence is  $(u_n)$ ?
    - c. Express  $u_n$  in terms of  $n$ .
    - d. Calculate the rent for the last month (the 36<sup>th</sup> month). Round the result to the nearest pound.
  3. Let's call  $v_n$  the rent (in pounds) the student will have to pay after  $n$  months with the second contract.
    - a. Express the second contract as a sequence. What kind of sequence would it be?
    - b. Calculate the rent for the last month.
  4.
    - a. Which contract seems to be more attractive for the student?
    - b. What would you have to calculate to answer this question? (method only)