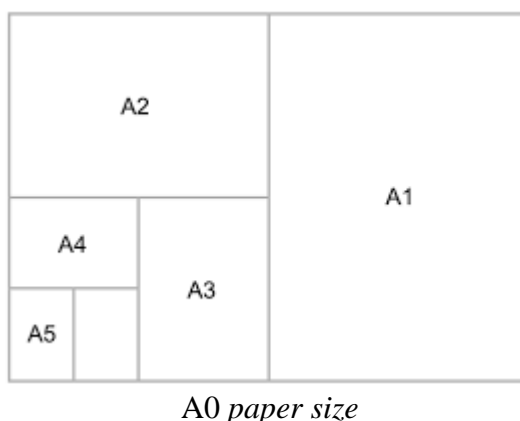## Subject n°41: <u>SEQUENCES</u>

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

Many paper size standard conventions have existed at different times and in different countries. ISO 216 specifies standard paper sizes used in most countries.

It is based on a single length-to-width ratio of $\sqrt{2}: 1$.

Dimensions are rounded to the nearest millimetre.

The base A0 size of paper is defined as having an area of 1 m^2 and is 841 mm by 1,189 mm. Successive paper sizes in the series A1, A2, A3, and so forth, are defined by having the preceding paper size across the larger dimension (for instance, A0 width is equal to A1 length and so on), as it appears in the figure below.

A0 *paper size*

Let W_n be the width of a An paper size.

1) Demonstrate that, for any whole number n, $W_{n+1} = \dfrac{W_n}{\sqrt{2}}$

2) What type of progression is (W_n)? Give the expression of W_n in terms of n.

3) Compute the dimensions of A4 paper size which is the most frequently used paper size.

4) What is the first paper size whose width is less than 60 millimetres?

5) Justify that the area of A1 paper size is one half of the area of A0 paper size, and that the area of each ISO paper size is one half of the area of the preceding size.