

Sujet n°11

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

Sequences

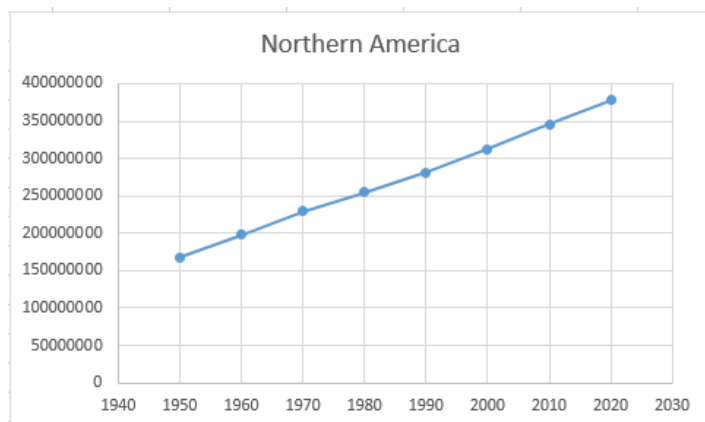
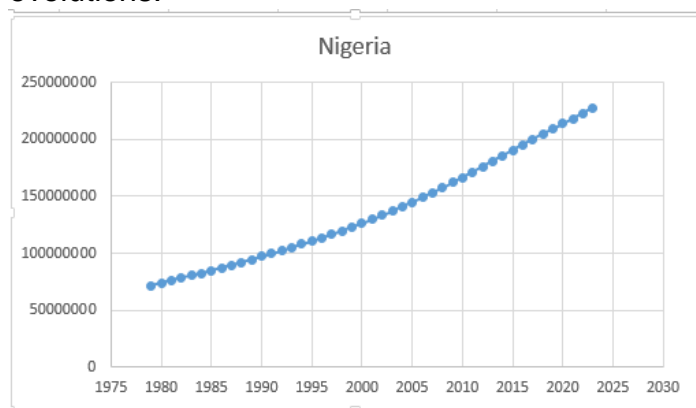
1) Warm up task:

What does the word "pattern" mean to you? What kind of mathematical patterns do you know?

2) Main problem:

2.1) The following graphs show the evolution of the population of Nigeria and Northern America over a period of time.

Use your mathematical knowledge to identify a pattern and find a model to describe these evolutions.



2.2) Below are some of the data that were used to draw the graphs.

Do they confirm or infirm your answers to question 2.1)?

Can you use them to be even more precise about your models?

Northern America	1950	168009342
	1960	198252643
	1970	229339589
	1980	254502384
	1990	281282376
	2000	312499983
	2010	345386050
	2020	377734350

Nigeria	1979	71498241
Nigeria	1980	73764644
Nigeria	1981	76068116
Nigeria	1982	78378696
Nigeria	1983	80438257
Nigeria	1984	82526444
Nigeria	1985	84897972
Nigeria	1986	87235959
Nigeria	1987	89591718
Nigeria	1988	92020092
Nigeria	1989	94531021
Nigeria	1990	97120926
Nigeria	1991	99720162
Nigeria	1992	102372779
Nigeria	1993	105122075

3) Follow up task:

Can you tell us something about the points and limitations of using mathematical models...

... as far as populations are concerned?

... generally speaking?