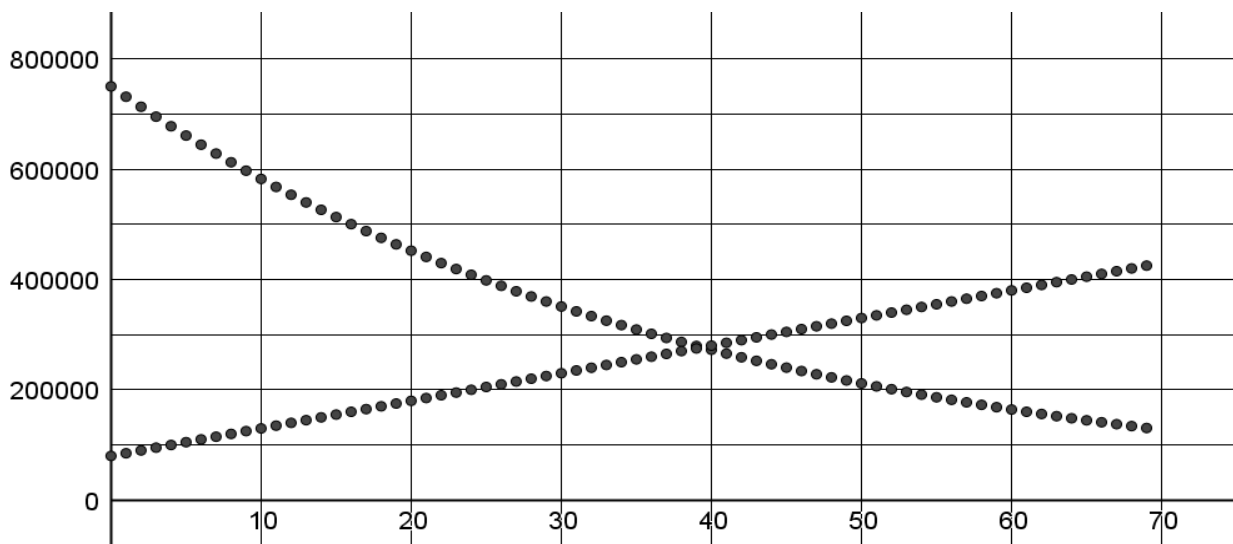## Crisis in the city of Detroit

Detroit, the main city of Michigan became a symbol of the financial crisis. Since years 2000, its population decreases from 2.5% per year and in the same time 5000 houses are deserted. In 2013, the population of the city was 750 000 whereas the total amount of deserted houses was 80 000.

1) Compute the population of Detroit in 2014 and 2015.

2) Explain how to work out the general term of the sequence.

3) Give the formula of the sequence describing the number of deserted houses.

4) Match the two sequences with the graphs below.

5) Conjecture the year when the number of inhabitants will be less than the number of deserted houses.

6) In 2013, the price of a house in Detroit was $ 68,000. A house loses 25% of its value each year. Give a method to determine when this house in Detroit will cost less than $ 20.

Eléments de correction

1) 731,250 in 2014 and about 712,969 in 2015

2) It's a geometric sequence, the common ratio is 0.975 and the first term is 750,000. So the general term is $p_n = 750,000 \times .975^n$.

3) It's a arithmetic sequence, the common difference is 5,000 and the first term is 80,000. So the general term is $h_n = 80,000 + 5,000 \times n$.

4) Obvious !

5) About 39 years.

6) Method : compute a table with a calculator , you get 29 years, that is 2 042.