

SEQUENCES

Please do not write on the exam paper, and do not forget to give back the examination paper at the end of the test

1. The production of a piano factory (called Treble Clef Ltd) follows an arithmetic sequence u , such as for every whole number n , u_n is the number of pianos manufactured during year $2,000+n$.

In 2000, the factory produced 750 pianos, so $u_0=750$.

In 2005, the factory produced 1,200 pianos.

- Give u_5 and justify that the common difference of this sequence is 90.
- For any n , express u_n in terms of n .
- In which year will the factory produce for the first time more than three times as many pianos as it initially did?

2. Another piano factory, Bass Clef Ltd, which was created in 2000, produced 350 pianos the first year.

Since then, each year, the production of this company increases by 10%.

For any whole number n , let v_n be the number of pianos produced during year $2,000+n$.

- Compute v_0 , v_1 and v_2 .
- What type of progression is (v_n) ?
- For any counting number n , express v_n in terms of n .

3. Find out in which year Bass Clef Ltd will have produced at least as many pianos as Treble Clef Ltd.