Geometric progression

№1. 700 bacteria were placed in a Petri dish. This type of bacteria doubles every hour. How many bacteria will be in the dish after one hour from the start of the experiment? After three hours? After six hours?

№2. The sequence of numbers in №1 is called a geometric progression. How does it differ from an arithmetic progression? Show that the number at position n can be calculated using the formula:

$$b_n = b_1 \cdot q^{n-1}.$$

The number q is called the common ratio of the geometric progression.

№3. *(Ukraine)* In a geometric progression, $b_1 = \frac{1}{2}$, $b_2 = \frac{1}{4}$. Find b_4.

№4. *(Ukraine 2011)* Determine the common ratio of the geometric progression (b_n) if $b_9 = 24$ and $b_6 = -\frac{1}{9}$.

№5. The number 486 is a term of the geometric progression 2, 6, 18, ... Find the position of this term.

№6. What two numbers should be inserted between 6 and 750 so that, together with these numbers, they form a geometric progression?

№7. The sequence (b_n) is given by the formula for the n-th term $b_n = 5 \cdot 4^{n-2}$. Is this sequence a geometric progression? If yes, indicate its first term and common ratio.

№8. The sequence (b_n) is a geometric progression. Find:

1. b_5, if $b_4 = 9$, $b_6 = 25$;
2. b_{17}, if $b_{16} = 2$, $b_{18} = 10$.

№9. The second term of a geometric progression is 6. Find the product of the first three terms of this progression.