Numbers Patterns (with Visualising Number Sequences)

A. Write the Missing Terms to Complete the Sentences:

1. The sequence 2, 4, 6, 8, 10, __, __ follows the pattern of adding ___ to each term.
2. The pattern A, C, E, G, __, __ follows the rule of skipping one letter. The missing letters are ___ and ___.
3. In a triangular number pattern, the first five triangular numbers are 1, 3, 6, 10, __.
4. The general form of an even number pattern is given by the formula 2n, where n is a _____ number.
5. If a pattern follows the rule Multiply by 2, then the next number after 3, 6, 12, 24 will be ___.

B. Mark each sentence with a True (✓) or False (✗):

1. The sequence 1, 4, 9, 16, 25 follows the rule n^2 (square numbers). ☐
2. The pattern 5, 10, 15, 25, 30, 35 follows a consistent rule. ☐
3. In a Fibonacci sequence, every number is the product of the previous two numbers. ☐
4. The sequence 100, 90, 80, 70, ... is an increasing pattern. ☐
5. The number sequence 2, 4, 8, 16, 32, 64 follows a division rule. ☐

C. Figure out the answers to these questions.

1. **Complete the pattern:** 1, 11, 111, 1111, _____
2. **Complete the missing term in the pattern:** 81, 72, 63, 54, ____, ____
3. **Identify the rule followed in the number pattern:** 3, 9, 27, 81, 243
4. What is the rule in the sequence 2, 6, 12, 20, 30, 42?
5. A staircase has 1 step, then 3 steps, then 6 steps, then 10 steps in the next row. What will be the number of steps in the next row?
6. A pattern starts with a single dot (•), then two dots in the next row (••), then three dots in the next row (•••), and so on. How many dots will be in the 7th row?

D. Challenge yourself with these questions

1. A farmer plants trees in rows. The first row has 1 tree, the second row has 3 trees, the third row has 6 trees, the fourth row has 10 trees. How many trees will be in the 6th row?
2. In a school, students form a marching sequence:

   a) 1^{st} row has 1 student

   b) 2^{nd} row has 2 students

   c) 3^{rd} row has 4 students

   d) 4^{th} row has 8 students

   Find the number of students in the 6th row.
3. **A machine follows a pattern:** It takes a number, multiplies it by 2, and then subtracts 3. If the input is 5, what will be the output?
4. **A sequence follows a rule:** Start with 2, then double the number and subtract 1 each time. The first term is 2. What are the next four terms?