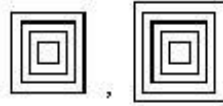
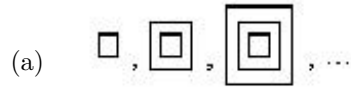


1. For each sequence below, determine the next two terms.



(b) 1, 4, 9, 16, ...

25, 36

2. Consider the sequence: 3, 8, 13, 18, 23, ...

(a) Is this sequence arithmetic or geometric?

arithmetic (difference is 5)

(b) Compute the 40th term of this sequence.

$$\begin{aligned} a + (n - 1)d &= 3 + (40 - 1)(5) \\ &= 3 + (39)(5) \\ &= 198 \end{aligned}$$

3. Find the first 4 terms of the sequence described by the following rule:

The first term is 2 and each term is one less than 3 times the previous term.

2, 5, 14, 41

4. Use Gauss' summation method to calculate  $1 + 2 + 3 + \dots + 999 + 1000$ .

$$\begin{array}{rcccccc} 1 + & 2 + & 3 + & \dots & +499 & +500 \\ 1000+ & 999+ & 998+ & \dots & +502 & +501 \\ \hline 1001+ & 1001+ & 1001+ & \dots & +1001 & +1001 \end{array}$$

So, the total sum is  $(500)(1001) = 500,500$ .

5. Suppose that there are three hats hanging on a hat rack. The first hat is green, the second hat is red, and the third is yellow. Amy, Babar, and Calvin each choose a different hat and put it on their head. How many outcomes are possible? (For example, one possible outcome is that Amy is wearing the yellow hat, Babar is wearing the green hat, and Calvin is wearing the red hat.)

One way to do this is to write out all of the possible combinations. A quicker way is to realize that one of the three people has to choose first. That person has 3 options to choose from. The next person has two options left to him/her. The remaining person has only the one remaining hat to choose. Multiplying the number of options at each stage, we get  $3 \cdot 2 \cdot 1 = 6$  outcomes.