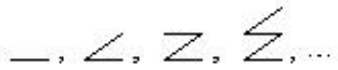


1. For each sequence below, determine the next two terms.

(a)  , ...



(b) 2, 4, 8, 16, 32, ...

64, 128

2. Consider the sequence: 3, 6, 12, 24, 48, ...

(a) Is this sequence arithmetic or geometric?

geometric (ratio is 2)

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

$$a \cdot r^{(n-1)} = 3 \cdot 2^{(40-1)} = 3 \cdot 2^{39}$$

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

The first term is 7 and each term is 4 less than twice the previous term.

7, 10, 16, 28

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 coats hanging on a coat rack. The first coat is blue, the second coat is gray, and the third is white. Ryan, Sam, and Tanya each choose a different coat and put it on. How many outcomes are possible? (For example, one possible outcome is that Ryan is wearing the white coat, Sam is wearing the blue coat, and Tanya is wearing the gray coat.)

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.