Amazing Problems: Arithmetic and Geometric Sequences

Teacher's Guide

Welcome, dear teachers.

Thank you for choosing this lesson for your students.

As you have seen, this lesson is about the sequences and introduces them through two funny, challenging problems that attract the students' attention.

This lesson is intended for high school students, and the prior knowledge required for the lesson has been covered in middle school, such as equations and their arithmetic operations such as addition, subtraction …etc.

At the end of the first activity, you may find that it is appropriate to mention the story of Gauss with the math teacher which I have mentioned already in the written teacher's guide that accompanies this lesson video.

In the fourth activity, draw the students' attention to the fact that the first fifty terms are the even numbers in the set of numbers from 1 to 100.

At the end of the sixth section, you may tell your students that there are many real-life problems that require understanding the arithmetic and geometric sequences.

For example, counting objects arranged in a hierarchical way and counting chairs in stadium stands are considered arithmetic sequences, while the annual percent of increase for the salary of an employee, and the population growth are examples of geometric sequences.

In the example of chess, when r = 2, the sum of the previous terms is equal to the current term – 1, which means that in the fourth square, there will be 8 grains of wheat, and the sum of the previous three squares is equal to 8-1 = 7.

 There are several additional problems that can be introduced to the students in order to expand their understanding of sequences, for example:

1 - Complete the missing terms in the following arithmetic sequence: -35, …, …, …, …, 5

2 - Find the arithmetic sequence, given: a4 = 12, a_7 = 18

3 - Is the sequence 4/1, 3/1, 2/ 1, 1 , … geometric?

4 - Proved that (a^{n-1}/2) is a geometric sequence then find the sixth term.

Finally, I would like to thank all the people who have contributed to the success of this lesson, hoping that it is a useful addition to the Arabic scientific library, and wish you all the best.