Teacher Guide:
Mathematics in Every Day Life: Trigonometric Functions; Linear Functions; and Linear Sytems Solutions

The purpose of this lesson is to increase student awareness that mathematics is useful and that they use math in many activities during their daily lives. In this lesson, we wanted to try out different types of functions. Your role as a teacher is very important because you must motivate your students to carry out the proposed activities. These can be modified as you think is best, in order to make them more accessible to your students. You can make some suggestions to make the process easier during the activity.

I think this lesson will be very useful for high school students. It is important for students to be able to represent mathematical models through functions, which is what we do during the lesson. I believe students will be able to understand the concepts discussed here.

At the beginning of the lesson, you might explain that in everyday life we find ourselves in situations in which values vary depending on a fixed rule. And that a function is defined as a pair of variables, one dependent on the other, that make up an established rule.

In the second activity, which deals with the calculation of gasoline consumption, it is recommended that students answer the specific questions they were given. If they have any concerns, you can support them in solving their questions, providing a brief explanation about the slope of a line, linear functions, mainly the point-slope form equation. You can also explain that when making a graph of the values, one can see whether the behavior of the function is linear or not. This way, they will be able to understand how to

calculate which gas station is best for Juan to go to. I suggest that in this activity, you guide students to note that driving distances consumes gasoline, so an apparent saving may not be a saving at all. In this activity, only a calculator is needed.

In the third activity, to find the cost of the food that Juan and his friends bought in the cafeteria, it is helpful for students to elaborate a matrix with the elements that are given in the situation, and with this, they can write a system of linear equations. In order for the students to calculate the cost of each food item, you can remind them how to write data in a matrix form and the different methods of solving three-by-three equations. Also, while using a different equation for Paco, you can support them by explaining a little bit about the lack of linear independence of the new equation with respect to the other one. As in the previous activity, only a calculator is needed.

Thank you for your time. I hope both you and your students enjoy this lesson and understand that math is everywhere, “even in the soup.” Good bye.

* The expression “hasta en la sopa” "even in the soup” [for its literal translation] is used when one refers to someone or something that is everywhere or present constantly. It is an exaggeration, of course, and in the context of this lesson it means that mathematics plays a role in many aspects of our everyday lives.