This workshop must be solved in the mathematics notebook, as a requirement
to take the competency test.
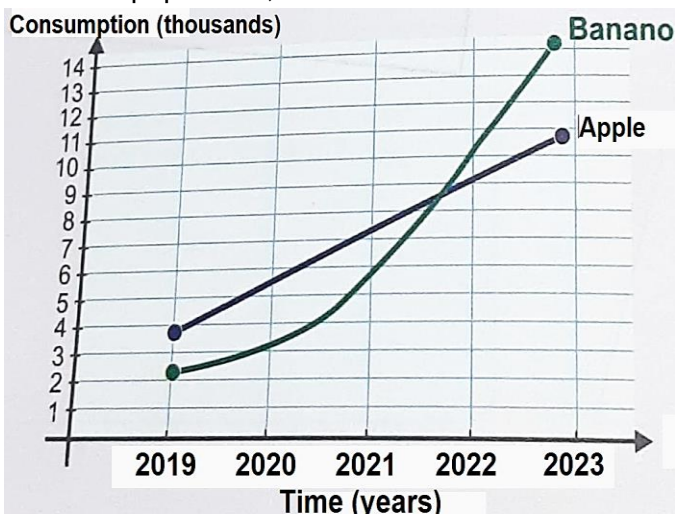**Delivery date: July 16th, 2024**

1. The following graph shows the distance that sound travels in different propagation media, with respect to time.
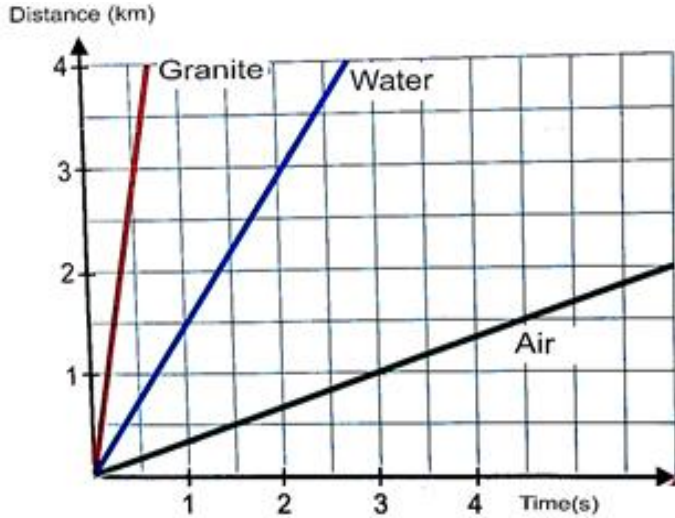
In which medium is sound faster?

ANSWER QUESTIONS 2 TO 4 ACCORDING TO THE FOLLOWING INFORMATION:

The following graph shows the consumption of two fruits in a population, between 2019 and 2023.


According to the graph, write whether the statement is TRUE or FALSE.

2. During the years 2019 and 2022, banana consumption was lower than apple consumption._____.

3. At no time from 2019 to 2023 was the amount of fruit consumed by the population approximately equal. _____

4. In 2019, the consumption of bananas and apples was the same. _____

ANSWER QUESTIONS 5 TO 8 ACCORDING TO THE FOLLOWING INFORMATION:

In a Formula 1 race, FERRARI competes against RED BULL, the FERRARI advances at a constant speed of 54 km/h while the RED BULL advances at 36 km/h.

5. After 30 minutes, what is the distance that separates the two cars?

6. Approximately how many km do cars move away per minute?

7. If the track on which the cars compete is 5.33 km long, how many minutes does it take the FERRARI to travel it?

8. Which of the following graphs represents the movement of the two cars?
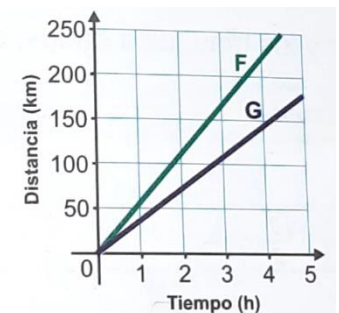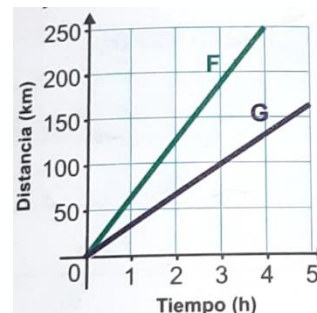
ANSWER QUESTIONS 9 AND 10 ACCORDING TO THE FOLLOWING INFORMATION:

A mobile starts from an initial point 1 meter away and moves at a constant speed of 2 m/s. Another mobile starts at the same time but from zero, at a constant speed of 3 m/s.

9. Represents the displacement of the two cars on the same Cartesian plane, relating distance and time.

10. At what moment do the two cars reach the same distance?

ANSWER QUESTIONS 11 TO 13 ACCORDING TO THE FOLLOWING INFORMATION:

A cycling stage has the following route:
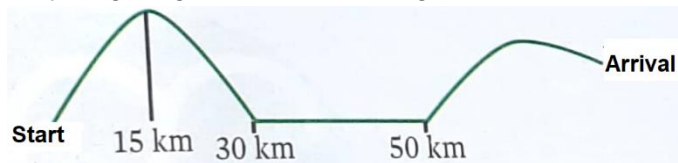
According to the graph, write whether the statement is FALSE or TRUE.

11. The section in which the stage is completely flat is between the start and kilometer 15, because its slope is positive. _____.

12. The section in which the stage is completely flat is between 15 km and 30 km, because its slope is negative._____

13. The section in which the stage is completely flat is between 30 km and 50 km because its slope is zero. _____

ANSWER QUESTIONS 14 AND 15 ACCORDING TO THE FOLLOWING INFORMATION:

The following graph shows the history of stolen motorcycles in a city in Colombia from 2015 to 2022..

14. According to the graph, between which year and the following year was the greatest increase in stolen motorcycles recorded?.

15. Between which year and the following year was the greatest decrease in stolen motorcycles recorded.

16. In a dance group, the number of men and women totals 40 people and their difference is 10. What is the number of men and the number of women that make up the group?

17. María goes to the store and pays $13,500 for 5 pencils and 2 pens. Later, Paola pays $6,000 in the same store for 2 pencils and 1 pen of the same reference. To determine the unit value of each product, María proposes the following system of equations:

$$\begin{cases} 5p + 2e = 13.500 \\ 2p + e = 6.000 \end{cases}$$

where p represents the value of each pencil and t the value of a ballpoint pen, in pesos.
When solving the Maria system, determine that the solution values are $p = \$1.500$ and $e = \$3.000$

The solution given by María is correct or incorrect. Why, justify your answer.

18. A student found that the solution to a system of equations is: $x = -1, y = 3$. Which of the following systems of equations did the student solve?

$$\begin{cases} 3x + 4y = 9 \\ 2x - 5y = 10 \end{cases} \qquad \begin{cases} x + y = -2 \\ 2x - y = 3 \end{cases}$$

$$\begin{cases} 5x - 4y = 7 \\ 3x + 2y = 3 \end{cases} \qquad \begin{cases} 5x + y = -2 \\ -2x + 2y = 8 \end{cases}$$

ANSWER QUESTIONS 19 AND 24 ACCORDING TO THE FOLLOWING INFORMATION:

Samuel walked from his house to the school, which is 6 kilometers away, and his sister then ran to catch up with him. The graph shows the distance traveled by Samuel and his sister as time passes.

— Samuel
— Samuel sister's
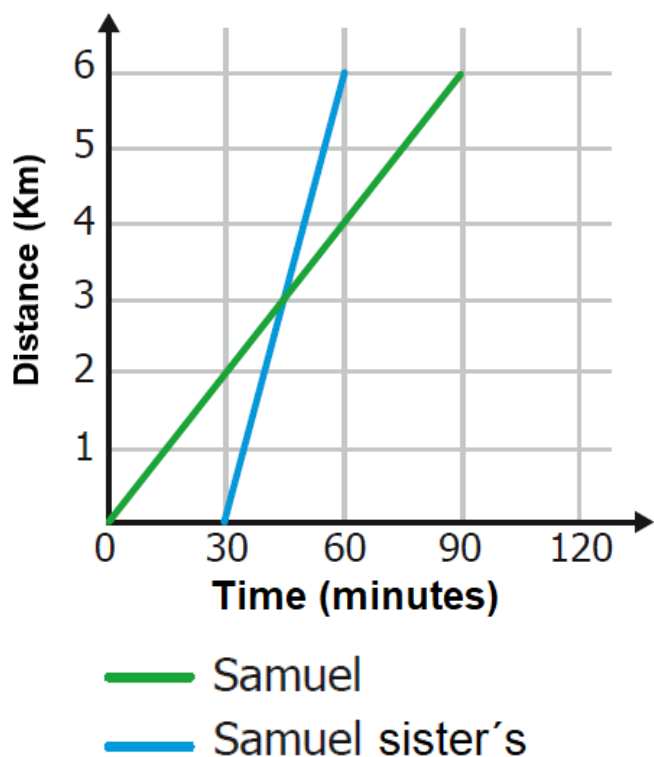
19. After how long the sister went looking for Samuel?.

20. How many kilometers had Samuel traveled when his sister caught up with him?

21. Did they arrive at school at the same time? Or who arrived first?

22. What was Samuel's speed during the trip?

23. What was your sister's speed?

24. How many hours did it take the sister to get to school?

25. In a building they place a cylindrical water tank, whose dimensions are 3 meters in radius and 10 meters in height. What is the water capacity that fits in the tank? Observe the information:
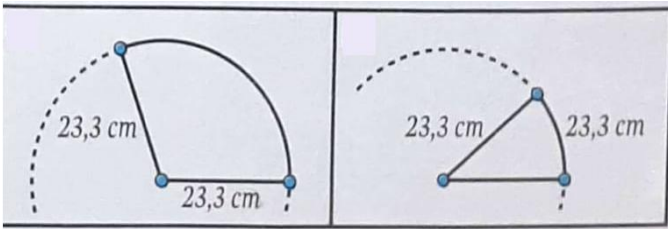

$$A_b = \pi * r^2$$
$$V_{cilindro} = A_b * altura$$
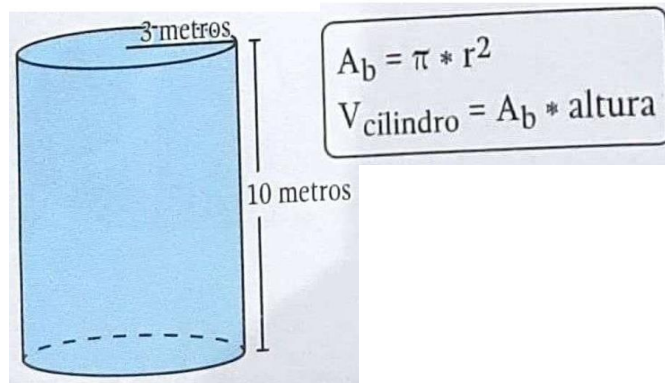
26. Juan must build a hat like the one shown in the image.

23,3 cm

Choose the appropriate mold to construct the hat.

23,3 cm 23,3 cm 23,3 cm 23,3 cm 23,3 cm
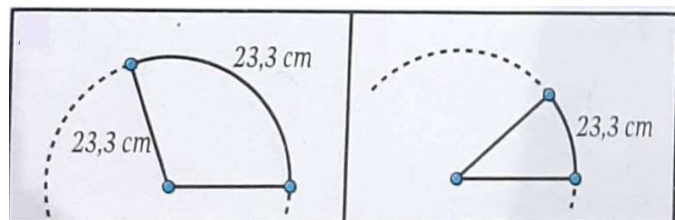
27. We want to build a cylindrical case and to do so the flat development shown below was created.:

12π cm

15 cm
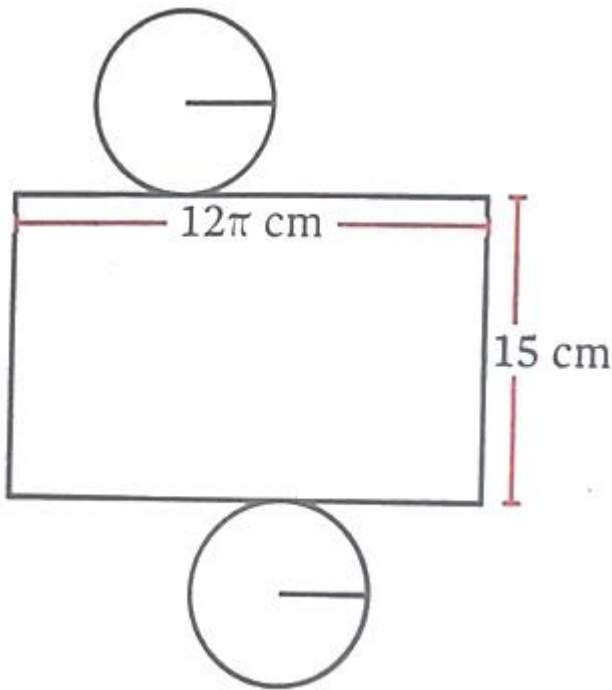
Draw the cylindrical case associated with this flat development. Indicate the measurement of the radius of the cylinder and its height. Remember that the perimeter of the circle is $2r\,\pi$.

28. Inside a cylinder of radius r at its base and height h, a cone has been placed in such a way that its base and height coincide, as shown below:

Volumen cilindro:
$$Vc = \pi r^2 * h$$

Volumen cono:
$$Vc = \frac{\pi r^2 * h}{3}$$
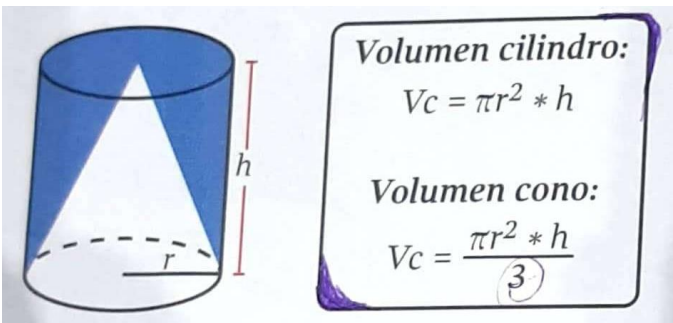
With the information presented, is it correct to affirm that the cylinder has three times the volume of the cone? Why?

29. Hugo has the following t-shirts in a suitcase.

7   3   1
6   9

If Hugo must take a t-shirt at random from the suitcase, what is the probability that he will take out a t-shirt marked with a number less than 6?

30. Karol designs earrings with three circular pieces united, with different color order. (Look at the photo).

How many different earrings can Karol create if she has circular pieces in six different colors?