



COLEGIO NACIONES UNIDAS I.E.D.
TALLER PREPARATORIO
I TRIMESTRE
MATEMÁTICAS 8°

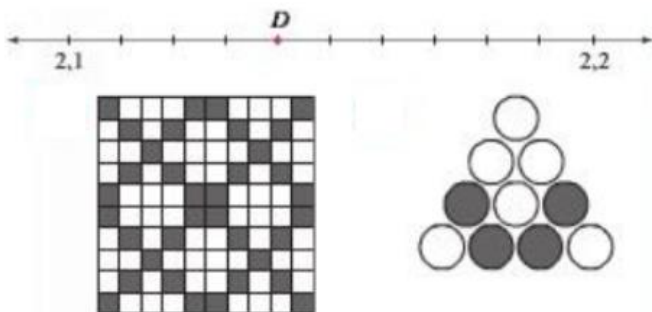
This workshop must be copied and solved in the mathematics notebook, as a requirement to take the competency test.

DELIVERY DATE: APRIL 2nd - 2024

1p) If one brick weighs 1 kilogram, how many kilograms does one and a half bricks weigh?



2p) Write the decimal number shown in each graph.



3P) A school is going on an expedition through Colombia: $\frac{1}{3}$ of the students go to the department of Antioquia, $\frac{2}{15}$ of the students go to La Guajira, and $\frac{2}{5}$ go to the Amazon.



What fraction represents the total number of students who traveled?

What fraction represents the students who did not go?

4p) At Juana's birthday party, the guests were served juice in $\frac{4}{10}$ L glasses. The total amount of juice is $\frac{22}{5}$ L. To find the number of guests served, divide the total amount of juice available by the capacity of each glass.

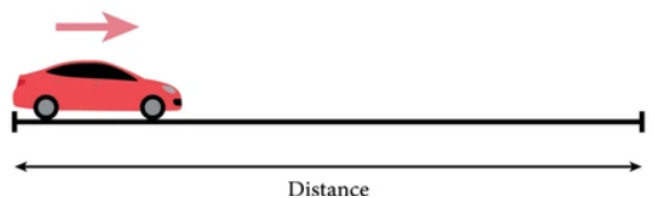
$$\frac{4}{10} \div \frac{22}{5} = \frac{4 * 22}{10 * 5} = \frac{88}{15}$$

Therefore, there was enough juice for $\frac{88}{15}$ guests.

There were errors in the above procedure, correct them and give the correct result.

5p) A car traveled $\frac{8}{10}$ of a kilometer in nine minutes. What fraction of a kilometer did it travel in three minutes?

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

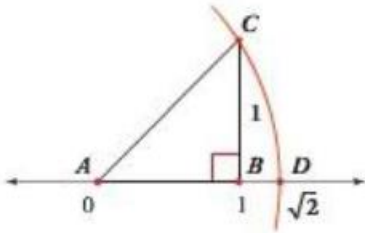


6P) Alexander wrote $\frac{1}{8} \div \frac{2}{7} = \frac{2}{7} \div \frac{1}{8}$

which property Alejandro wanted to apply to this expression.

Is there a property of multiplying rational numbers that applies to this division? explain with examples.

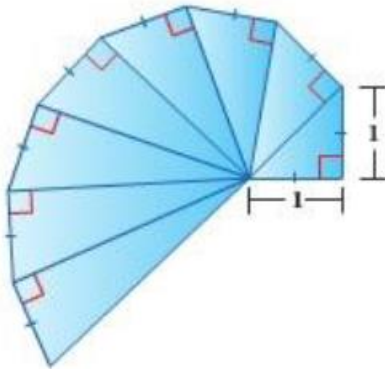
7L) What irrational number is represented in the following graph?



8L) Which of the following numbers are irrational, explain your answer?

- a) 0,100100100...
- b) 0,623462346223...
- c) 3,1421142214231424...
- d) $-\sqrt{10} + 5$
- e) $3\pi - 7$

9P) Write down the irrational numbers that can appear in the following picture.



10P) What is the definition of irrational numbers? Explain your answer.

- a) A rational number is any number that can be represented as the quotient of two integers.
- b) They are numbers that have infinite non periodic decimal places and therefore cannot be expressed as fractions.
- c) A real number can be a rational number or an irrational number.
- d) They are those that allow the elements of a set to be counted.

11 i) When data are grouped into class intervals, how does this affect the interpretation of the frequency distribution compared to ungrouped data?

Data: 17, 5, 22, 18, 25, 29, 17, 15, 12, 21, 14, 18, 19, 22, 11, 7, 16, 24, 9, 23, 27, 16, 13, 8

Groups	Frequency
5 - 9	4
10 - 14	4
15 - 19	8
20 - 24	5
25 - 29	3

range = $29 - 5 = 24$
 group size = $\frac{24}{5} = 4.8 \Rightarrow 5$

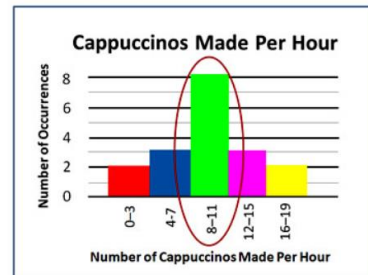
12i) What considerations should be taken into account when choosing the size of class intervals in a grouped frequency distribution?

13i) How can you estimate the mode in a clustered frequency distribution?

Number of Cappuccinos	Freq
0 - 3	2
4 - 7	3
8 - 11	8
12 - 15	3
16 - 19	2



Image source: <http://www.blogspot.com>



14p) How could you visually represent the relationship between the number of sales (variable 1) and the month of the year (variable 2) using a bar chart?



15P) What type of bar chart would you use to compare the number of students enrolled in different majors (variable 1) at a university and to visualize how this varies over the years (variable 2)?

16L) What is the algebraic expression representing "twice a number increased by three units"?

17i) If the algebraic expression $3x^2 + 5x - 2$ represents the area of a rectangle as a function of its length x , what can we say about the behavior of the area as x increases?

18i) If the expression $4x+7$ is a monomial, what can we say about the number of terms it has?

19i) What type of polynomial is $2x^3 + 5x^2 - 3xy^2 + y^3$ and how many terms does it have?

20p) What is the importance of combining like terms when simplifying an algebraic expression, and how would this affect the final result?

21p) What strategies could you use to identify and group like terms in a more complex algebraic expression?

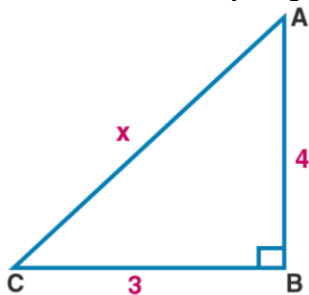
22P) What strategies could you use to simplify an algebraic expression by combining like terms efficiently and accurately?

23P) What strategies would you use to solve a linear equation with one unknown, such as $3x+5=11$?

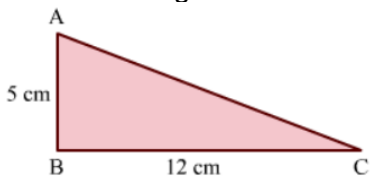
24P) What are the implications if a linear equation with one variable has a single solution, infinitely many solutions, or no solutions at all?

25P) How might you use a linear equation with one variable to make predictions about future events or to analyze patterns of behavior in historical data?

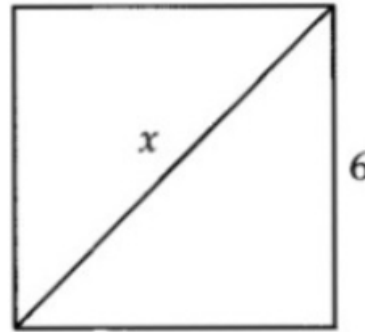
26i) If a triangle has sides of length 3, 4, and x respectively, what value of x would satisfy the condition of the Pythagorean theorem?



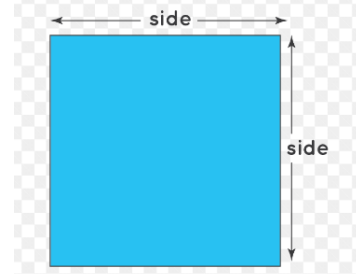
27i) If we know that a triangle is right-angled and that two of its sides are 5 and 12 units long, what can we deduce from the Pythagorean Theorem about the length of the third side?



28i) If we have a square with one side of length 6 units, what could we infer about the length of the diagonal using the Pythagorean Theorem?

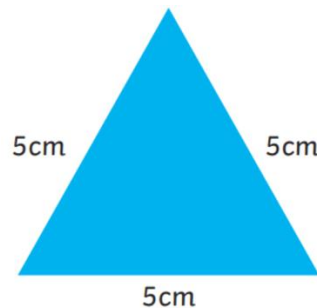


29P) How could you express algebraically the perimeter of a square with a side of $x+3$ units?



Perimeter of Square, (P) = $4 \times \text{Side}$

30P) How could you use algebraic expressions to find the perimeter of an equilateral triangle with each side of length $x^2 + x - 3$ units?



$$5 + 5 + 5 = 15\text{cm}$$

Perimeter = 15cm