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"Discovering my STEAM vocation"

Quick Math Challenges - C3 Mobility - Italy

POLAND

TASK 1

My daughter has many sisters. She has as many sisters as she has brothers. Each of her brothers has twice as many sisters as brothers. How many sons and daughters do I have?

TASK 2

In the (correct) calculation shown, some of the digits were replaced by the letters P, Q, R and S. What is the value of P + Q + R + S?

TASK 3

I have some unusual dice. On their faces are the digits 1 to 6 as usual, however the odd numbers are negative (so -1, -3, -5 instead of 1, 3, 5). I throw two such dice at the same time. Which of the following sums can I definitely not achieve with one such throw?

(A) 1 (B) 3 (C) 4 (D) 7 (E) 8

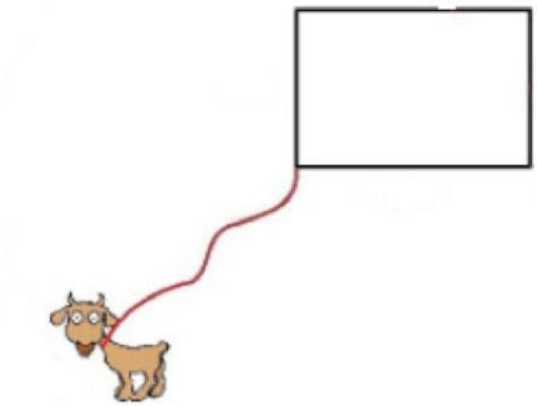
TASK 4

Yvonne has 20 €, each of her four sisters has 10 €. How much does Yvonne have to give to each of her sisters so that each person has the same amount of money?

SPAIN

- There are 30 students in class. If everyone studies Portuguese or Italian, and we know that 22 students study Portuguese and 15 study Italian. How many students study both languages? How many study only Portuguese? How many study only Italian?

- A goat is tied with a 30 metre-length rope to the corner of a rectangular farmhouse. The dimensions of the farmhouse are 10x20 m. How large is the portion of the plot where it can graze? (the goat can't enter the farmhouse).



ITALY

1) Putting the five pieces of the puzzle in the correct way, you'll get a rectangle in which you will read an operation. **Calculate the result.**

A) –100 **B)** –8 **C)** –1 **D)** 199 **E)** 208

2) All the vases have the same height and each has the capacity of 1 liter. We pour half a liter of water into each vase. **In which vase will the level of water be higher?**

A)  **B)**  **C)**  **D)**  **E)** 

3) The area of the big square is 16 cm^2, and the area of each of the four grey squares is 1 cm^2. **Calculate the area of the black flower.**

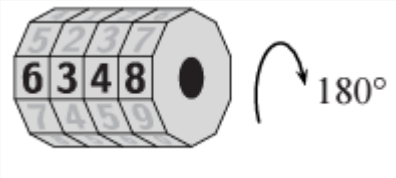
4) Three circles are joined as shown in the picture. **In which of the pictures below the three circles are joined in the same way?**

A)  **B)**  **C)**  **D)**  **E)** 

FRANCE

1) Each of the four wheels of a bicycle lock is numbered 0 through 9 in chronological order.

On the opposite position, we obtain the padlock code by turning each wheel half a turn.



What is the lock code?

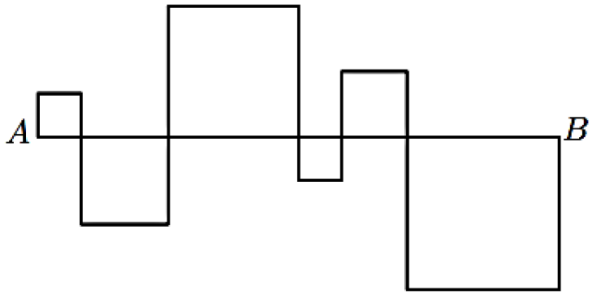
2) In the operations below, each letter always represents the same number.

$$\begin{array}{r} JK \\ +\ YZ \\ \hline 137 \end{array} \qquad \begin{array}{r} JZYK \\ +\ YKJZ \\ \hline ? \end{array}$$

What is the result of the second operation?

PORTUGAL

1. John drew six squares like the ones in the image. The line segment [AB]measures 24 cm, so what is the perimeter of the image?



A: 96 cm

2. On his birthday, John multiplied his age by the age of his older brother. When he multiplied the result by 5, he got 2015. What was João's older brother 's age when he was born?

A: 18

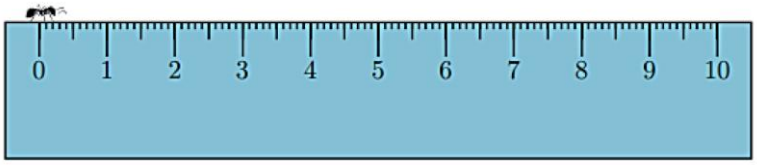
3. Alfred is a taxi driver and was hired to take a client to a nearby village. On the way there he drove at 60 km/h and on the way back he had a mechanical breakdown and he could only drive at 20 km/h. What is Alfred's average speed in the whole journey?

A: 30 km/h

4. Balthazar added the length of the three sides of a rectangle and as a result, he got 44 cm. Gaspar also added the length of the three sides of the same rectangle and got 40 cm. How many centimeters is the perimeter of that rectangle?

A: When we add the result that Balthazar got with the result that Gaspar got, we have the triple of the sum of the length with the width of the rectangle. So, the sum of the length with the width is 1/3 (44+40) = 28. The perimeter of the rectangle is 2x28=56 cm.

5. An ant moves along a graduated ruler, with marks from 0 to 10 cm, like the one in the image.



The ant starts its journey in number 0. Each second, the ant moves 1 cm. When the ant arrives at number 0 or at number 10, it turns around and starts moving in the opposite direction. This process takes 1 second. In which number will the ant be after 2021 seconds?

A: The ant takes 10+1+10+1= 22 seconds to fulfil a complete turn, turn around and be at the original position. Since 2021is 91x22+19, at the end of 2021 seconds, the ant gave 91 full turns and spent 19 seconds in the last turn. In this last turn, the ant spent 11 seconds in the first half and 8 seconds in the second, so the ant finished in the number 10-8= 2.