**JtA010910** **Cercate l'errore**

Consider the four pieces of information, as follows: three of them are true and one is false.

1. Audrey is older than Béatrice.

2. Clément is younger than Béatrice.

3. The sum of ages of Béatrice and Clément is twice the age of Audrey.

4. Clément is older than Audrey.

***Determine who is the youngest, who is the oldest. Explain.***

******

**JtA011011 Al massimo volume**

As a roll of plastic mesh 3.50 m. long and 70 cm high is available, we would like to build a composter without lid to fill with dead leaves.

We have not decided what shape the base will be like, maybe round. We want to maximize the volume employing the least plastic material.

***Would you please help us solve this problem? Write your own suggestion on the answer sheet***.

JtA011112 Sconti sconti sconti!

In the local shop, there is a special sale for fair-trade coffee and some adverts have already been prepared with the following text:

The shop assistant knows that the discount ***x*** decided by the management is such that

0,4 < ***x*** < 1/2.

Which advert should he put on display? Explain the reasoning that led you this answer .

#### JtA011213 L’età di Fido

Charley Slowpop is about to propose to his fiancé when her brother comes in.

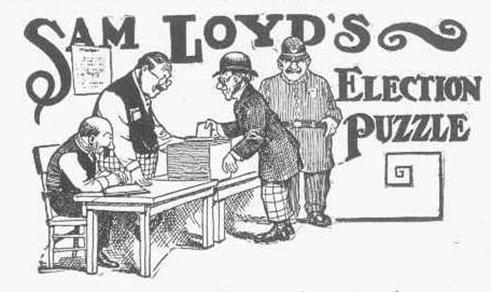
“You can’t tell a dog’s age by the number of rings in his bark” said l’enfant terrible, “but five years ago my sister  was four times older than Fido, now she is only three times as old”. Charley Slowpop is very anxious  to know Fido’s age.

***Can you help him?***

**JtA011314 L’elezione**

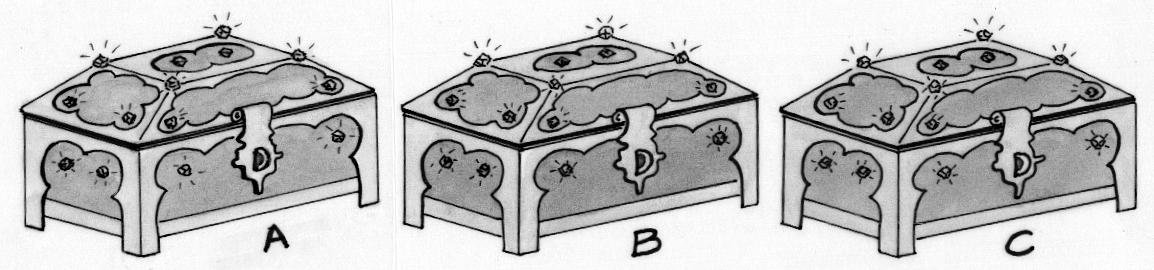
Here is a simple but somewhat pretty problem which developed at a recent election where 5,219 votes were cast for four candidates. The victor exceeded his opponents by 22, 30 and 73 votes, and yet not one of them knew how to figure out the exact number of votes received by each.

***Can you give a simply rule for living the desired results?***

****

#### JtA011415 Dov’è il ritratto?

Once upon a time there was a beautiful princess who had three caskets: A, B and C. She had put her portrait into one of the caskets.

Anyone who wished to marry her had to find out which casket contained her portrait.

A sentence was written on each casket:

Casket A:  “The portrait is not here.”

Casket B:  “The portrait is here.”

Casket C:  “The portrait is not inside casket B.”

***Only one of these three sentences is true. Find out which casket contains the portrait. Justify your answer.***

***[](http://www.google.it/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRw&url=http://huurauto-blog.nl/2013/01&ei=ERuLVYrqNczaUZaPgUg&bvm=bv.96339352,d.bGQ&psig=AFQjCNHgz7QhlFOAQu-x_UBb2BSsIzLX0g&ust=1435266132705806)***

#### JtA011516 Volare leggeri

I’m flying to London with hand luggage only and I have to obey the restrictions of the flight company!

As I can choose among slightly different suitcases, I wonder:

* ***by how much (in percentage) would the volume increase if the length of each side increased by 10% or 15%?***
* ***by how much (in percentage) should the length of each side increase so that the volume approximately doubles?***

#### JtA011617 Indoviniamo

Giorgio challenges his friend Marco that he can guess any number thought by him. Marco does not believe Giorgio’s guessing skills and accepts the challenge.

Giorgio tells him:

“Think of a number.

* Add 3 to this number.
* Multiply the result by 2.
* Finally, subtract 5 from the number obtained.

Which number did you get?”

Marco replies “9” and Giorgio immediately says to the astonished friend: “So, the number that you thought originally

was 4”.

***Explain how Giorgio could provide the exact answer, without any hesitation.***

#### JtA011718 Il ladro mente

A painting has disappeared from the Museum of Mathematics.

The police are interviewing 4 suspects. The thief tells lies. The others tell the truth.

***Who is the thief?***

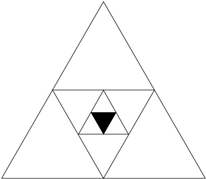
**JtA011819** Tutti a Gardaland

To celebrate her birthday Anna suggests her friends Bianca, Carlo and Donato to take a trip to Amusement Park Gardaland. However, everyone has his own conditions:

* Bianca won't go if it's not sunny or if her foreign friend come to visit her.
* Carlo won't go if it's rainy.
* Donato will only go if all four people are coming and only if it's not a holiday.

***If the day of Anna's birthday it does not rain (even if it is cloudy) and it's not a holiday and Bianca's friend doesn't come to visit her that day, with whom will Anna be able to go to Gardaland?***

**JtA011920 Triangolo di triangoli**

****

This is my little brother's jigsaw puzzle. All its pieces are identical. He has already placed a black piece.

***How many pieces are there in this puzzle ? Explain your answer.***

**Note** : All triangles in the figure are equilateral.

**JtC010910 Tutti a Gardaland**

To celebrate her birthday Anna suggests her friends Bianca, Carlo and Donato to take a trip to Amusement Park Gardaland.

However, everyone has his own conditions:

* Bianca won't go if it's not sunny or if her foreign friend come to visit her.
* Carlo won't go if it's rainy.
* Donato will only go if all four people are coming and only if it's not a holiday.

*If the day of Anna's birthday it does not rain (even if it is cloudy) and it's not a holiday and Bianca's friend doesn't come to visit her that day, with whom will Anna be able to go to Gardaland?*

# JtC011011 Parliamoci!! Let’s speak to one another!

While waiting for an international sport competition to begin Albert, Ben, Carla, Denis and Elisa are sitting on a bench.

3 of them are English speakers, 2 Italian speakers and 3 Spanish speakers.

Each speaker is talking to the one sitting beside, speaking the only language the two have in common. The speakers sitting at the two ends of the bench can speak only one language.

Which languages can the one who is sitting in the middle speak

Explain your answer indicating one of the possible solutions.

JtC011112 L’imbroglio

Graziella, who is one of the most rigorous Maths teacher in the school gave his pupils a simple homework, albeit a bit repetitive. Throw a dice 200 times and records the results obtained in a table. Alessandro, who does not want to waste his time with throwing dices and records, he wrote the following table and gave it to his teacher:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***Number*** | 1 | 2 | 3 | 4 | 5 | 6 |
| ***Frequency*** | 21% | 18% | 17% | 19% | 16% | 11% |

Graziella dismissed him saying that he did not report real data.

***How could Graziella discover that Alessandro was cheating?***

#### 

#### JtC011213 Rivelatore di bugie

David the magician is going on stage and is showing the audience three big boxes.

There are two rabbits drawn on one of the three boxes, two doves on another one and a rabbit and a dove on the last one.

Blindfolded David asks one of the member of the audience to put two rabbits into one box, two doves into another box and finally a rabbit and a dove into the last box so that the content of each box does not correspond to its drawing.

Then David announces that taking one single animal out of only one of the three boxes is enough for him to find out the content of each box.

***Explain his reasoning***

**JtC011314 La fantasia della collana**

Enrica is an artist in composing jewels with recycled materials that she accumulates in drawers, grouping them in small drawers. Wanting to make  a necklace with recurring sequences, she puts on the table the content of the first small drawer, which contains four items respectively green, (tiger) streaked, black and white.

The objects turn out to be placed as follows:

- the first object is a lozenge

- the green object is before the white

- the ball of the eye of the tiger is the second

- the button comes before the onyx object (black)

- the pendant is not white.

***If Enrica chains the objects in this order,***

***how does the resulting sequence look like?***

***For each component, specify the type and colour.***

**JtC0114145 Tappi preziosi**

[](http://www.google.it/imgres?imgurl=http://www.abilitychannel.tv/wp-content/uploads/2012/10/cd19.jpg&imgrefurl=http://www.abilitychannel.tv/10578/blog-science/carrozzine-per-disabili-1/&h=327&w=353&tbnid=8RKa4Lp7yggagM:&zoom=1&docid=p7Gk1jEtifC6uM&hl=it&ei=KrtOU4iNIMiGswbroIHABA&tbm=i)

Soft drinks companies can easily re-cycle and re-use their plastic bottle caps.

In order to pay for a wheel chair for a retirement home, Madame Carmela tells the whole school on the first day of session:

*“We will need 1 000 000 plastic corks!!!*

*Can you bring in at last 60 per month.”*

***if the school is a big one, do you think she will reach this target by the end of the school year?***

***After you have explained your answer, indicate the time needed to achieve the target.***

**JtC011516 Faticoso leggere i bandi**

While looking for a job, Fabio, Enrico, and Tina stumble upon a job offer that lists the following:

*“The candidate will pass the first stage if, based on the attached criteria, she achieves a total score, across all tests, of at least 60/100 and, for each test, a score at least equal to half of the maximum score that can be obtained in that test: A (30 points), B (20 points), C (20 points), and D (30 points)”.*

They take part to the tests and obtain the following scores:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Candidates** | **Total Scores** | **Individual scores** | | | |
| **A** | **B** | **C** | **D** |
| Enrico | 55 | 15 | 12 | 13 | 15 |
| Fabio | 62 | 22 | 10 | 11 | 19 |
| Tina | 65 | 30 | 12 | 8 | 15 |

***Who has passed the first stage (and why)?***

**JtC011617 Una festa particolare**

Laura, who is always looking for any opportunities to make a cake, decides to celebrate on October 10th 2016 her 20,500 days since she was born. In fact, on which day should she have celebrated her birthday in 2016 and how old would she be on that day? Explain your reasoning

**JtC011718 Corretto o no?**

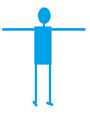
The following statements are true:

* Anna is Italian and over 18 years old
* all Italian people over 18 years old can vote to elect deputies
* all Italian people holding a driving license are over 18 years old.

***Which of the following statement is not correct? Explain your answer.***

1. Anna can vote to elect deputies.
2. In Italy, who is not over 18 years old does not have a driving license.
3. All Italian people who hold a driving license are over 18 years old.
4. Who does not have the driving license is not 18 years old.

**JtC011819 Canestro!**

**** The basketball rim is 3,05 m above the ground.

Assuming the following proportions among the different parts of the body:

* The height of the player coincides with the maximum span between the fingertips (arm span)
* The length of the shoulders is of the total height
* The total length of the head and the neck is of the total height.

***If a player is 1.96 m tall, how high does he/she have to jump to touch the rim?***