

1<sup>ST</sup> MOLTO WORKSHOP

**VARNA, BULGARIA | Варна, България**

7 September 2010

**MOLTO**

***Mathematical Grammar***

***Library***

JORDI SALUDES AND SEBASTIAN XAMBÓ

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# MAIN POINTS

- The WP6-Math case study
- A motivating experience (CANGUR)
- WebALT MGL
- WP6-Math planning

## The WP6-Math case study

Driving a meaningful dialog with the learner  
in the context of mathematics word problems

GF based

- simple drill library

- driving a CAS with NL

- dialog management for word problems

Pushing forward the WebALT MGL

Showing the possibilities of the interlingua concept

## A motivating experience (CANGUR)

<b>Level</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Age</b>	14	15	16	17

[2009-1](#)

[2009-2](#)

[2009-3](#)

[2009-4](#)

Peter O'Holloran (Australia)

1991 *Le Kangourou*

1996 Cangur

30 questions, 75 min

Calculators not allowed

4. (*Rússia*) Quina és la quantitat més petita de xifres que cal esborrar en el nombre 12323314 per tal de trobar un nombre capicua?

- A) 1    B) 2    C) 3    D) 4    E) 5

4. (*Russia*) What is the least number of digits you need to delete in the number 12323314 in order to find a palindrome?

- A) 1    B) 2    C) 3    D) 4    E) 5

## GOOGLE

What is the smallest amount of numbers you need to delete | the number 12323314 in order to find a **number Capicua**?

palindrome: the number remains the same when written in reverse order, like

13331

5. (*Ukraine*) We have three boxes: one is white, another is red and the last is black. One is empty, one has an apple, and another has a chocolate bar. Find what color is the box that has the chocolate bar if we know that the chocolate is in the white box or in red box and the apple is neither in the white box nor in the black box.

- A) White   B) Red   C) Black   D) Red or Black  
E) It is impossible to know



**Google** (Cat→Eng)

5. (*Ukraine*) We have three boxes: one white, one red and another black. One is empty, | there is an apple, and the other a chocolate bar. Find what color is the box where **you know that** chocolate is | **the chocolate box or white box red apple** and is neither in the white box or the black box.

- A) White   B) Red   C) Black   D) Red or Black  
E) It is impossible to know

## Andrew Jobbings 'discussion papers'

### Statistics for selected questions from the European Kangaroo 2006

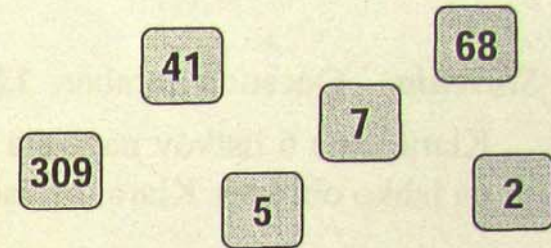
A discussion paper collating information provided by the following countries.

Austria	Belarus	Catalonia	Czech Republic	Estonia	France
Georgia	Hungary	Italy	Lithuania	Netherlands	Pakistan
Slovakia	Slovenia	Sweden	Switzerland	United Kingdom	

Many other countries that did not send data answer

**France** Question number: 11

Six nombres sont écrits sur des cartes (dessinées ci-contre). Quel est le plus petit nombre que l'on peut former en posant toutes ces cartes côte à côte?

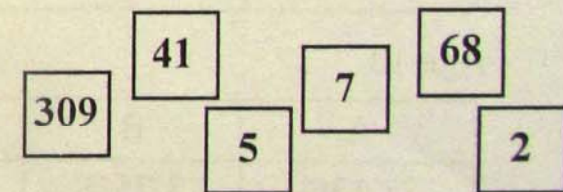


- (A) 2574168309      (B) 1023456789      (C) 3097568241  
 (D) 2309415687      (E) 2309415678

A	B	C	D	E	No/invalid answer	Entries
27.4%	22%	6.2%	<b>22.9%</b>	15.5%	6%	76 033

**Georgia** Question number: 12

ბარათებზე დაწერილია ექვსი რიცხვი (იხილეთ სურათი მარჯვნივ). რას უდრის ის უმცირესი რიცხვი, რომლის შედგენა შეგიძლია ამ ბარათებისაგან?



- (A) 1234567890      (B) 1023456789      (C) 3097568241  
 (D) 2309415687      (E) 2309415678

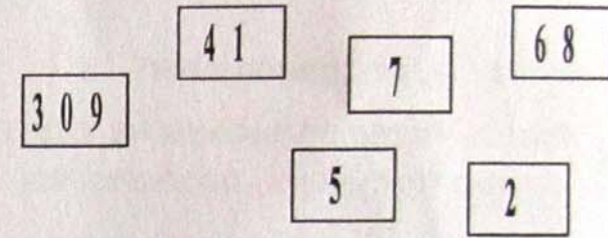


**Hungary** Question number: 12

Hat kártyára számokat írtunk az ábrán látható módon. Melyik az a legkisebb szám az alábbiak között, amelyet a hat számkártya egymás mellé helyezésével ki lehet rakni?

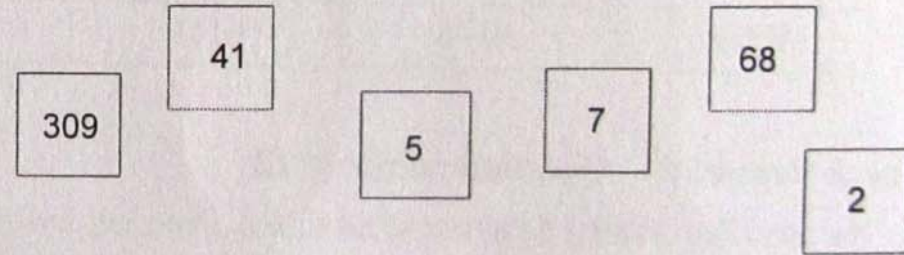
- (A) 1234567890      (B) 2341568709      (C) 3097568241  
 (D) 2309415687      (E) 2309415678

*No statistical data available.*

**Italy** Question number: 8

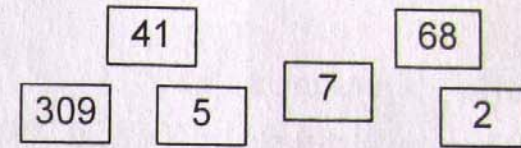
Osserva la figura: sei numeri sono scritti su altrettanti foglietti. Accostando tutti i sei foglietti puoi formare dei numeri di dieci cifre. Qual è il più piccolo?

- (A) 3094157682      (B) 2309541687  
 (C) 3097568241      (D) 2309415687  
 (E) 2309415678



**Slovakia** Question number: 11

Na šiestich kartičkách sú napísané čísla (obr.). Aké naj menšie číslo sa dá vytvoriť pospájaním všetkých kariet do jedného radu?

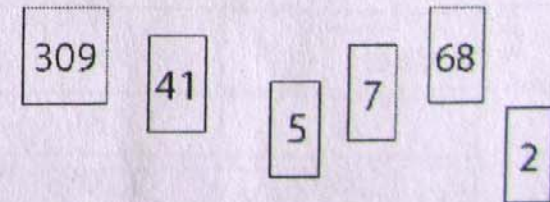


- (A) 3094157682      (B) 2574168309      (C) 2413095687  
 (D) 2309415687      (E) 2309415678

A	B	C	D	E	No/invalid answer
5,4%	17,0%	3,0%	<b>30,4%</b>	41,3%	2,9%
416	1297	229	2324	3150	218

**Sweden** Question number: 14

Sex tal står skrivna på korten här intill. Vilket är det minsta tal man kan bilda genom att lägga korten efter varandra?



- (A) 1234567890      (B) 1023456789      (C) 3097568241  
 (D) 2309415687      (E) 2309415678

**Sweden** Question number: 2

Vilket är det minsta 10-siffriga tal som kan bildas genom att man skriver följande sex tal efter varandra: 309, 41, 5, 7, 68 och 2?

- (A) 1234567890      (B) 1023456789      (C) 3097568241      (D) 2309415687      (E) 2309415678

*Austria* Question number: 2

Wenn man die sechs Zahlen 309, 41, 5, 7, 68 und 2 in beliebiger Reihenfolge nebeneinander anschreibt, entstehen verschiedene 10-stellige Zahlen. Welche ist die Größte unter diesen Zahlen?

- (A) 9 876 543 210      (B) 4 130 975 682      (C) 3 097 568 241      (D) 7 568 413 092  
(E) 7 685 413 092

## WebALT MGL

Multilingual repository of mathematical problems

EN, CA, ES, FI, IT, SV, FR (old labels)

→ First exposure to GF

Hindrances

It did not work for GF >2.9

Was not modular

Need to include more languages

## WP6-Math planning

Breaking W-MGL into CD modules

(CD: a way to agree on naming objects)

Code upgrade to GF 3.1 (Eng, Cat, Spa, Ita, Fre, Ger)

Extension to other languages (Swe, Dan, Bul, Pol, Fin, Dut)

Благодаря!

!Thank you!