Name of Competition: Contest in Mathematical Linguistics within the Winter Mathematical Competitions.

Area: Linguistics.

Scale: National.

Venue: Ruse or Pleven in even-numbered years, Varna or Burgas in odd-numbered years.

Time: the last Saturday of January or the first (or second) Saturday of February.

Target Group: forms 8–12 (divided into two groups, forms 8–10 and forms 11–12, for the purposes of ranking), sporadically forms 5–7. The contest is **individual** and **inclusive** (open to all who wish to participate).

Number of Participants in the Last Three Years:

year	forms 5–7	forms 8–10	forms 11–12	total
2005	9	27	44	**80**
2006	0	72	56	**128**
2007	9	45	57	**111**

Style: classical (problem-solving). The set, for which 4½ hours (formerly 4 hours) are given, consists of three problems chosen by the Chairman of the National Committee. Typically the problem set is the same for the two senior groups; for the junior group there is a different one.

Marking: performed on the spot after the contest by the National Committee.

History: Held annually since 1984.

Financial Basis: Supported by the Ministry of Education, the Union of Bulgarian Mathematicians, the contestants' schools and municipalities and local sponsors.

E-mail for Contacts: iad58g@gmail.com (Ivan Derzhanski).

Problem (2006; Alexander Piperski).[1] The following are the names of the months in Ukrainian in their calendar order, starting with January:

> *sičen', ljutyj, berezen', kviten', traven', červen', lypen', serpen', veresen', žovten', listopad, gruden'*

And here are 11 dates in another Slavic language, Croatian:

> *4. travanj, 30. studeni, 2. kolovoz, 3. veljača, 5. ožujak, 3. lipanj, 1. rujan, 31. listopad, 4. svibanj, 3. srpanj, 1. listopad*

It is known that these dates all belong to the same non-leap year and the gap between each two adjacent dates is 29 days (as between 1 and 31 January).
Translate the Croatian dates.

Solution: The month *listopad* in the Ukrainian calendar is November, but the Croatian *listopad* has 31 days. What month might that be? If it is not the same as the month that has the same name in Ukrainian, it is probably one of the neighbouring months. If *listopad* is October, skipping 29 days forwards and backwards we obtain this sequence:

> 3.II., 5.III., 4.IV., 4.V., 3.VI., 3.VII., 2.VIII., 1.IX., <u>1.X.</u>, <u>31.X.</u>, 30.XI.

These are precisely 11 dates. The following one would be 30.XII., and the preceding one 4.I., but we only have one 30th and two 4th dates.

We see instantly that *studeni* is November (*listopad* in Ukrainian), *rujan* is September (*veresen'*), *kolovoz* is August (*serpen'*) and *ožujak* is March (*berezen'*). The remaining month names are established unambiguously if we keep on assuming that if a Croatian month has the same name as an Ukrainian one, they are adjacent at most. Actually it turns out that they are always adjacent, and the Croatian ones precede the Ukrainian ones. {There is only one exception: January is *siječanj* in Croatian as in Ukrainian, and December is *prosinac*.}

3.II.	*veljača*	*ljutyj*
5.III.	*ožujak*	*berezen'*
4.IV.	*travanj*	*kviten'*
4.V.	*svibanj*	*traven'*
3.VI.	*lipanj*	*červen'*
3.VII.	*srpanj*	*lypen'*
2.VIII.	*kolovoz*	*serpen'*
1.IX.	*rujan*	*veresen'*
1./31.X.	*listopad*	*žovten'*
30.XI.	*studeni*	*listopad*

---

[1] Published as an article: 'Listopad in Zagreb', *Matematika+* **14/54.2**:20–22 (in Bulgarian).