International contest.

Albert FRANK & Philippe JACQUEROUX

Regulations of the contest.

1) Everybody can participate. The participation is free.
1)It is not allowed to speak of solutions of the problems with other people.
2)All your answers have to be send in ONE sending.
3)The prize (to define) will be something of a value of 100 Euros (offered by: 50% Mensa Belgium,50% Mensa RAL France.) and can't be exchanged for money.

Required knowledge:

For most problems, little knowledge is needed.
Concerning the numeric sequences, except the basic operations, it is sufficient to know exponents, prime numbers, transcendent numbers (pi, e) or to familiarize yourself with them.
For some problems, it is sufficient to know the squares covered by a queen in chess.
None of the problems require academic knowledge.

The authors:

Albert Frank, mathematician and chess player, is member of 11 high I.Q. societies: Mensa, Sigma, Cerebrals, Glia, OATH, Prometheus and Pi subscriber. He classified second at the first international contest created in 2000 by Philippe Jacqueroux. He writes many articles in various fields : logic, statistics, paradoxes and sociology. He is the author of the book " Chess and aptitudes ", published in U.S.A.

Philippe Jacqueroux has been a member of Mensa France since 12 years. He is also member of Cerebrals, Glia, and subscribes to Pi society. Passionate of problems as researcher but also as creator. He is the initiator of the first contest.
More informations are available at http://www.multimania.com/artphil /

Philippe Jacqueroux   Albert FRANK
22 Rue Pierre Allard   13 Clos du Parnasse / box 45
69500 Brons   1050 Brussels
France   BELGIUM
Mail:jacqueroux@infonie.fr   albert.frank@village.uunet.be
----

1)

***4 brothers and two sisters.***

The first brother always says the truth
The second brother always gives the opposed direction
The third brother says the truth the even days and lies the odd days
The fourth brother says the truth the odd days and lies the even days
The first sister always answers on the right of the truth
The second sister always answers on the left of the truth

You arrive at a crossing of 4 paths and you don't know who you are going to meet.
You must find the correct road to follow in only one question. What is this question?
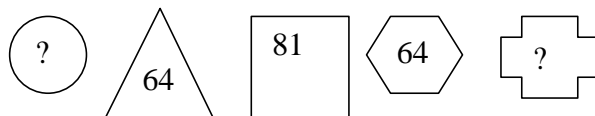(your question is already ready before meeting one of the persons).

2)

To cover a chessboard 8x8 , 5 queens are enough.
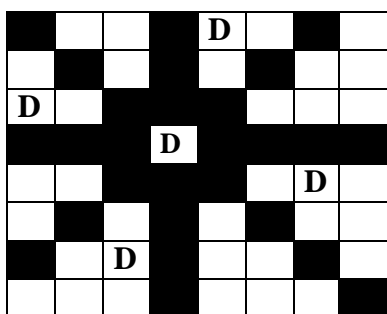
In black, the squares covered by the central queen on a chessboard 8x8.
The 5 queens cover all the non occupied squares of the chessboard.

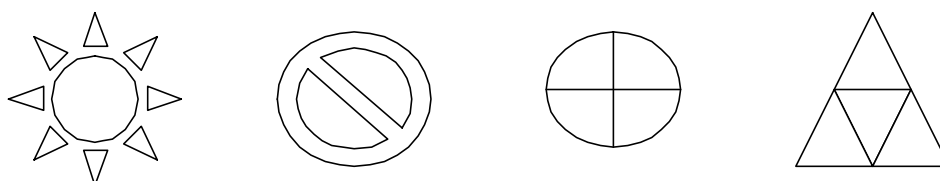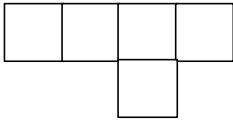What maximum dimension of chessboard do you manage to cover with 16 queens?

3)Complete.

4)   9   3   2   ?

5)
From this piece constituted of 5 unit cubes, can you build a cube 10x10x10
Explain.

6)You are parachuted between the tropic of the cancer and the capricorn.
You must surrender to a pole, and you only have a compass
distort whose needle indicates SE/NW. (you don't know it).
You decide to follow the indications of the compass and to take a direction
North or South to join the pole. What is the minimum distance that you will have to
cover to join one of the poles?
Explain.

Sequences:

7) T4 H6 O8 D12?

8) H I N O S?

9)? D I L M V?

10) A D O P Q? ?

11) 12 13 22 15 1213 1**7** 32 23?

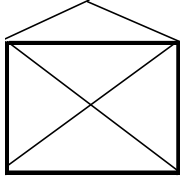12) 3 5 2**77** 353 773?

13) 5 5 12 14 19 24 26?

14) 1 4 5 9 10 15?

15)Complete.

V	B	E	N	J
F	O	H	Z	P
A	?	Y	N	K
R	X	R	S	T
W	T	G	X	U

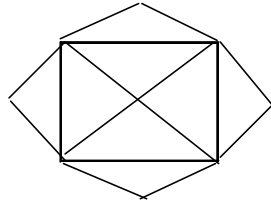
16) envelope and super envelope. This is well known and easy : without raising the pencil, and without coming backward, cover all lines of the drawing:

Now take a super envelope :

In the same conditions, is it possible to cover all the lines ? If yes, give a solution ; if no demonstrate why.

17) What is this ? : hijklmno

18) What is the minimum number of queens required to cover all the non occupied (by these queens) squares of a 6 X 6 chessboard? Specify on which squares the queens must be (one solution is enough).

19) In the chess game, what is the shortest possible "stalemate", without captures of pieces or pawns? In addition to the solution, give your reasoning.

Sequences. Justifications of the answers, although not required, are welcome.

20) 2, 4, 5, 8, 7, 10, 9, 12, 15, 12, 17, 16, ?, ?

21) 8, 18, 40, 84, 154, ?

22) 5, 8, 12, 18, 24, 30, 36, 42, ?

23) 4/10, 4/20, 2/30, 2/40, 3/50, ?

24) 2, 16, 36, 74, 133, ?

25) 4, 5, 5, 6, 14, 11, 8, ?

26) 4, 3, 1, 3, 5, 5, 1, 9, ?

27) 208, 210, 108, 40, 15, 9, ?

28) 1, 2, 6, 42, 1770, ?

29) 263514 ???642

30) 6, 2, 4, 10, 21, ?

Answers must be sent to one of the two authors by regular mail or e-mail before
the end of the contest (September 30th 2001.)