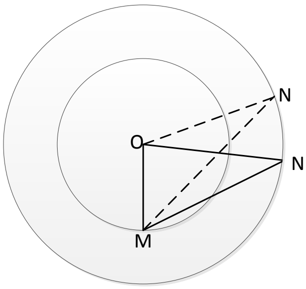
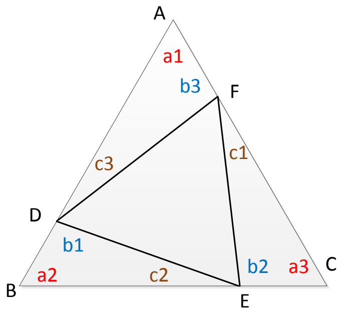
IBM research

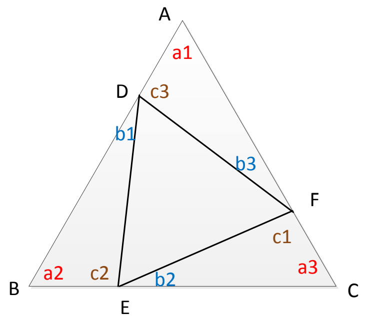
The challenge: August 1998

http://domino.research.ibm.com/Comm/wwwr_ponder.nsf/challenges/August1998.html

My Solution:







1.We can prove ： $\angle MON \uparrow, \angle OMN \downarrow, MN \uparrow$ ， suppose $OM \le ON$.(Left Figure)

2.Suppose that $\angle A \le \angle B \le \angle C$,

Case 1: $DE \ge DB$ ， (Middle Figure)

$\angle a1 \le \angle a2 \le \angle a3$ ， so $BE \le CF \le AD$

We can also get $\angle a2 \ge \angle a3$ by the relationship of $\angle OMN$ and MN in Step1.

So $\angle a2 = \angle a3, AB = AC, AD = CF$ ， $\Delta ADF \triangleq \Delta BFE$ ，

$\angle a1 = \angle a2 = \angle a3 = 60^\circ$

Case 2: $DE \le DB$ (Right Figure), we also get $BE \le CF \le AD$.

We can get $\angle b1 \le \angle b2 \le \angle b3$ by the relationship of $\angle MON$ and MN in Step1.

Then $\angle c1 \le \angle c2 \le \angle c3$.

We can also get $\angle c2 \ge \angle c1 \ge \angle c3$ by the relationship of $\angle OMN$ and MN in Step1.

So $\angle c1 = \angle c2 = \angle c3 \Rightarrow \angle b1 = \angle b2 = \angle b3$,

Then $\angle a1 = \angle a2 = \angle a3 = 60^\circ$