

Problem of the Month Round Robin Tournament

10/2010

In a round-robin tournament, each team plays with all of the other teams exactly once.

Consider the following round-robin tournament setup:

- N teams play a round-robin and exactly one team is eliminated from further play.
- The remaining $N - 1$ teams play another round-robin tournament. And then a second team is eliminated.
- Round-robin tournaments continue, with one team eliminated at the conclusion of each round-robin, until one team (the champion) remains.

What percentage of total games played in the multiple round-robin tournaments does the champion play?

SUBMIT your solution to

- Dr. Erol Akbas @ matexa@langate.gsu.edu or
- Dr. Yuanhui Xiao @ matyxx@langate.gsu.edu

before the **deadline: Friday, October 29, 2010, 5:00PM.**

You may get a copy of this problem from **the wall behind you.**

Problem of Last Month: An Alliance

An alliance consists of seven (7) nations. Each nation in the group speaks at most two (2) languages. Among any three (3) of the nations there are at least two (2) who speak the same language. Show that there are three (3) nations who speak a common language.

Winner: None.

Solution. Let's label the nations as N_1, N_2, \dots, N_7 . We know that in any group of 3 nations there are at least two who speak the same language. Let's pick N_1, N_2, N_3 and assume that N_1 and N_2 speak the same language. Consider the case that N_3 can't communicate with N_1 and N_2 . If you consider all groups of three containing N_2 and N_3 , since N_1 and N_2 speak the same language and a nation can speak at most two languages, there must be at least three nations who speak the same language.