

# University of Washington Math Hour Open Olympiad, 2013

## Grades 6-7

1. Goldilocks enters the home of the three bears – Papa Bear, Mama Bear, and Baby Bear. Each bear is wearing a different-colored shirt – red, green, or blue. All the bears look the same to Goldilocks, so she cannot otherwise tell them apart.

The bears in the red and blue shirts each make one true statement and one false statement.

The bear in the red shirt says: "I'm Blue's dad. I'm Green's daughter."

The bear in the blue shirt says: "Red and Green are of opposite gender. Red and Green are my parents."

Help Goldilocks find out which bear is wearing which shirt.



2. The University of Washington is holding a talent competition. The competition has five contests: math, physics, chemistry, biology, and ballroom dancing. Any student can enter into any number of the contests but only once for each one. For example, a student may participate in math, biology, and ballroom.

It turned out that each student participated in an odd number of contests. Also, each contest had an odd number of participants. Was the total number of contestants odd or even?



3. The 99 greatest scientists of Mars and Venus are seated evenly around a circular table. If any scientist sees two colleagues from her own planet sitting an equal number of seats to her left and right, she waves to them. For example, if you are from Mars and the scientists sitting two seats to your left and right are also from Mars, you will wave to them.

Prove that at least one of the 99 scientists will be waving, no matter how they are seated around the table.

4. One hundred boys participated in a tennis tournament in which every player played each other player exactly once and there were no ties. Prove that after the tournament, it is possible for the boys to line up for pizza so that each boy defeated the boy standing right behind him in line.



5. To celebrate space exploration, the Science Fiction Museum is going to read Star Wars and Star Trek stories for 24 hours straight. A different story will be read each hour for a total of 12 Star Wars stories and 12 Star Trek stories.

George and Gene want to listen to exactly 6 Star Wars and 6 Star Trek stories. Show that no matter how the readings are scheduled, the friends can find a block of 12 consecutive hours to listen to the stories together.

