

HOMEWORK/PROBLEMS 1

MAT160: Mathematical problems and games.
Spring 2005

02/01/2005. Due on 02/08/2005

Instructions: Make teams of 3 or four people. Solve the following questions.

1. Suppose you have a 3x3 Tic-Tac-Toe board. Is it possible to create a strategy to win? What about if you have a 3x4 board? Is it possible to have a strategy to win? Which player has an advantage?

2. You have seven glasses on a table, all face down. You are allowed to turn over four glasses at a time, as many times as you want. Is it possible to end up with all seven glasses face up?

3. You have 9 coins, one of which is counterfeit and weighs less than the others. Use two weighings on a balance with two pans to find the counterfeit coin.

4. Mary and Lucille live in two different towns, 50 miles apart. They decided that they want to see each other. So, on Sunday at 10am they take their bicycles and ride toward each other. Their speed is of 25mph. At the same moment,(10am) Mary's pigeon starts flying toward Lucille. The pigeon flies with 60mph. When it gets above Lucille it turns back and flies toward Mary. When it reaches her it turns back and flies toward Lucille, etc. So at 11am all our three characters meet at half-distance. What is the distance traveled by the pigeon?