Final Homework

Due by last day of class before finals

Problem 1. There are 18 beans in a pile. Two people playing against each other take turns removing either 1, 2, or 3 beans from the pile on each turn. The person who removes the last bean(s) wins the game.

1. Describe a winning strategy for this game. Don't just list the way to win. You must describe *why* the strategy works, **not** just what the strategy is.

2. What about 1, 2, 3, or 4? Describe *what* the strategy is and *how* it differs from the previous strategy.

Problem 2. For this problem, to get full credit, you must draw an accurate (as possible) picture of the situation and show all you work. A goat is tied to one of the corners of a rectangular barn on a rope that is 30 feet long. The dimensions of the barn are 40 feet by 30 feet.

1. Assuming that the goat can graze wherever its rope allows it to reach, what is the square footage of the grazing area for the goat?

Problem 3. You have placed in storage 170 pounds of cucumbers which are 98% water by weight. After a week or so, some evaporation has occurred whereby the cucumbers are now only 97% water by weight.

1. What does your batch of cucumbers now weigh?

2. Suppose after this evaporation, someone came by and ate a cucumber, removing 1 pound of cucumber from the batch. Now how much of the batch is water by weight? You must explain your reasoning to get credit.