

Math 364 - First Day Exercises  
Fall 2008

1. On one particularly sober day in the senate chamber, all 100 senators were seated and uncharacteristically silent. The following two statements had just been released by a nonpartisan government watchdog organization:

- There exists at least one honest senator.
- Given any two senators, at least one of them is dishonest.

In fact, each of the two previous statements is true. In view of these statements, your challenge is to see if you can determine exactly how many of the 100 senators are honest and how many are dishonest. If those numbers can be determined using only the given information, then find the number of honest senators. If the number cannot be found, explain why not. Do your numbers help explain why the senators sat in silence?

2. As everyone well knows, Indianapolis Jones, the archaeologist and obsessive-compulsive treasure hunter hates snakes. After a long and exciting quest to uncover just one of the pieces of the priceless and ancient *Vass* vase, Indianapolis Jones found himself face-to-face with two ornate boxes (so, more accurately, he was face-to-boxes). One box was embossed with a coat of arms that contained an image of a diamond, while the other was marked with an image of two crossed swords. Given all of his research, he knew that each box contained either a precious *Vass* piece or a family of 100 deadly snakes that instantly kills anyone whose nickname is a city or metropolitan area. Indianapolis had no choice - he had to open on box. He reached into his pocket and removed the final clue - a piece of parchment with an ominous message written in Sanskrit. Indianapolis read two statements, which, when translated into English, were, "At least one of the boxes contains a treasured *Vass* piece. But beware: A colony of poisonous snakes awaits you in the diamond-embossed box." Indianapolis had deduced from previous clues that either both statements are true or both are false. Your challenge is to determine which box Indianapolis should open in order for him to *safely* accomplish his ultimate goal: To get a *Vass* vase.