

- 3) Three Prisoners Problem: Three prisoners are given, uniformly at random, an orange or green hat. They see the hats of the other people, but not their own. Later, in separate rooms, each must decide whether to guess his or her own hat color, or to pass. If everyone who guesses is correct, then everyone is set free. If one person guesses wrong, or if they all pass, they are all subjected to M. Night Shyamalan's "The Last Airbender."



- a. Find a strategy such that they go free with probability $1/2$.
 - b. Can you do better?
 - c. What if you knew the warden liked green better than orange and randomly gives out green hats with probability $3/4$ and orange hats with probability $1/4$? Now what?
- 4) A coin is to be used for the Superbowl kickoff, but the umpire is not certain that it is actually a fair coin. How could he cleverly use the coin in such a way that the team captain who guesses only have a $1/2$ chance of being successful?