

Quantitative Reasoning 28: The Magic of Numbers

Homework 4

Assigned on Wednesday Sept 24th
Due at 12 noon Friday Sept 26th

Please submit problem sets at the end of the relevant lecture, or leave in the box labeled QR28 outside the Math Department's main office, on the third floor of the Science Center (Room 325).

Reading:

Gross-Harris, Chapter 4

Problems:

Please explain your reasoning and show your work.

1. Filling in the favorite books section of her facebook.com entry, a student chooses 4 books out of the 11 standard books of choice: *Catcher in the Rye*, *Portnoy's Complaint*, *Lord of the Rings*, *The Great Gatsby*, 1984, *To Kill a Mockingbird*, *The Odyssey*, *Catch 22*, *Harry Potter*, *Nullstellensatz*, and *Snowcrash*. How many ways are there for her to make the choice?

Suppose she has actually read 1984 so she decides to definitely choose that one. How many ways are there for her to make a choice of 4 given that one of them must be 1984?

2. It's time to look ahead to the next season for the Harvard women's ice hockey team. Suppose they play 30 games in the season and end up winning 24 of those games, and losing 6. How many possible win/loss records are there? (By win/loss record I mean a list of which games were won and which were lost.)

What if we drop the condition that the team win 24 games and only require that they win more than half of their games – how many possible win/loss records are there (assuming that each game ends in a win or a loss)? *Hint:*

There are three possibilities for a season – winning more than half of your games, winning less than half of your games, and winning exactly half of your games. Using this you should be able to derive a concise solution.