TOPIC 5: Systematic Checking (Homework Problems):

Homework Problems:

1) Let a be a positive integer less than 300 and consider the rational numbers a/30. Find the sum of all of those fractions which are in lowest terms (e.g. count 1/30 but not 2/30 and so on).

2) Find the smallest positive cube ending in 888.

3) A positive integer n has 1000 digits in its decimal representation so that exactly one digit is different from 5. Show that the number is not a square.

4) A board consists of six adjacent squares. Two players A and B take turns making entries from the digits 0, 1, 2, …, 8, 9 into empty squares until all six squares are filled with a digit. Different squares may contain the same digit and A starts. At any stage players A and B can choose any remaining empty square to fill in a digit. After B has placed his last digit in the last remaining square the board is viewed as the decimal representation z of an integer. B wins if z is divisible by a prior agreed upon number n. For each number n ε {1, 2, 3, …, 14, 15} determine whether B can force a win.