

## Math 55 Discussion problems 2 Mar

- How many positive integers between 1000 and 9999 inclusive
  - are divisible by 9?
  - are even?
  - have distinct digits?
  - are not divisible by 3?
  - are divisible by 5 or 7?
  - are not divisible by either 5 or 7?
  - are divisible by 5 but not by 7?
  - are divisible by 5 and 7?
- In how many ways can a photographer at a wedding arrange 6 people in a row from a group of 10 people, where the bride and the groom are among these 10 people, if
  - the bride must be in the picture?
  - both the bride and groom must be in the picture?
  - exactly one of the bride and the groom is in the picture?
- How many bit strings of length 10 contain either five consecutive 0s or five consecutive 1s?
- Show that if seven integers are selected from the first 10 positive integers, there must be at least two pairs of these integers with the sum 11.
  - Is the conclusion in part (a) true if six integers are selected rather than seven?
- Prove that at a party where there are at least two people, there are two people who know the same number of other people there.
- There are 51 houses on a street. Each house has an address between 1000 and 1099, inclusive. Show that at least two houses have addresses that are consecutive integers.