

Finite sets

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1 Prepare for class

Try to solve the following puzzle like questions.

1. How many teams can we form from the 26 students in our class if:
 - a. Every team contains an odd number of students.
 - b. Any two distinct teams have an even number of students in common.

2. How many teams can we form so that no team contains another team as a subset.

3. a. 25 friends meet for dinner at a restaurant. The restaurant has five tables. each table seats five persons. What is the smallest number of dinner parties needed so that each person will dine with every other person?
b. Can you schedule these dinners so that every person will dine with every other person exactly once.

4. 16 students meet every morning to play Badminton. They have four courts so they form 4 teams. Can you schedule the teams so that in five days every student will play with every other student exactly once? (play with another student means be on court with him, not necessarily as a pair. For instance if 1 3 6 13 are playing then 1 will not play again with 3, 6, or 13).

1.1 Finite Fields

Please review the basic definitions and properties of finite fields: $GF(q)$.