# Discrete Mathematics
# Drill-6

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Hanoi 2011
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## 1 Drill

### 1.1 Finite fields, finite projective geometries

1. Find the equation of the line through the points $(2,3),(4,5)$ in $GF^2(7)$.
2. 16 persons meet every evening. They sit around four tables, each table holdong four persons. Arrnage a seating so that after five meetings each person will sit with every other person at a table.
3. Find the equation of the line through the points $(0,1,3),(1,0,2)$ in the finite projective plane $PG(5,2)$. Find all other points on this line.
4. Do the same for the points $(0,1,0),(1,0,1)$.
5. Find the intersection of these lines.

### 1.2 counting

1. List all bit strings of length 5 that do not contain 00 as a substring.
2. How many integers $< 5000$ are relatively prime to 15?
3. Find the longest increasing subsequence and the longest decreasing subsequence in: $22,6,17,5,23,10,15,21,3,19,9,20$.