Question 1
Consider the following list of axioms for a geometry.

- **H1** There are exactly four points.
- **H2** There are exactly five lines.
- **H3** Each point has exactly three lines through it.
- **H4** Every pair of lines meet at at least one point.

Find a model for this geometry and determine with proof whether or not each axiom depends on the other three.

Question 2
Consider the $\mathbb{Z}_7$ affine geometry.

- Find the equation of the line $\mathcal{L}$ through the points (1, 3) and (4, 4).
- Determine the other points of the line $\mathcal{L}$.
- Find the equation of the line $\mathcal{M}$ through the point (2, 2) parallel to the line $\mathcal{L}$.
- Find the intersection points with $\mathcal{L}$ and $\mathcal{M}$ of the line $\mathcal{N}$ with equation $2x + 3y = 4$.
- Sketch the lines $\mathcal{L}$, $\mathcal{M}$ and $\mathcal{N}$ on the 49-point grid of the geometry.