

Some notes from class

2018-01-12

4 point geometry

Undefined terms: point, line, on

Axioms:

- ① There are exactly four points.
- ② Any two points have exactly one line that is on both of them.
- ③ Each line is on exactly two points.

Consistent?

Independent?

Complete?

A four point theorem

Def. If two distinct lines are on the same point, then they are said to *intersect*.

Def. Two lines that do not intersect are called *parallel* lines.

Theorem

In four point geometry, every line is parallel to at least one other line.

Proof.

Fano's geometry

Undefined terms: point, line, on

Axioms:

- ① There exists at least one line.
- ② There are exactly three points on every line.
- ③ Not all points are on the same line.
- ④ There is exactly one line on any two distinct points.
- ⑤ There is at least one point on any two distinct lines.

Young's geometry

Undefined terms: point, line, on

Axioms:

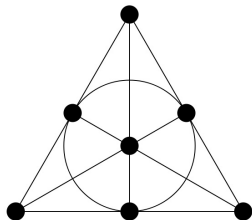
- 1 There exists at least one line.
- 2 There are exactly three points on every line.
- 3 Not all points are on the same line.
- 4 There is exactly one line on any two distinct points.
- 5 For each line ℓ and each point P not on ℓ , there exists exactly one line on P that does not contain any points on ℓ .

Fano's geometry

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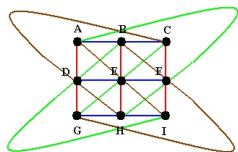
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Spot-it

