Some notes from class

2018-01-19

Incidence Geometry

Undefined terms: point, line, on

Axioms:

1. For each two distinct points, there is a unique line that is on both of them
2. For every line, there exist at least two distinct points that are on it.
3. There exist at least three distinct points.
4. Not all points lie on the same line.

Parallel possibilities

How do parallel lines behave (in a given type of geometry)?

If ℓ is a line and P is a point not on ℓ, then

1. . . . there does not exist a line on P parallel to ℓ.
2. . . . there exists exactly one line on P parallel to ℓ.
3. . . . there exists more than one line on P parallel to ℓ.

Euclid's definitions and postulates

A point is that which has no part.
A line is breadthless length.

Postulates:

1. To draw a straight line from a point to any other point.
2. To produce a straight line continuously in a straight line.
   Sometimes written as: Any straight line segment can be extended indefinitely in a straight line.
3. To describe a circle with any center and radius.
4. That all right angles are equal to one another.
5. That, if a straight line falling on two straight lines makes the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, meet on that side on which the angles are less than two right angles.