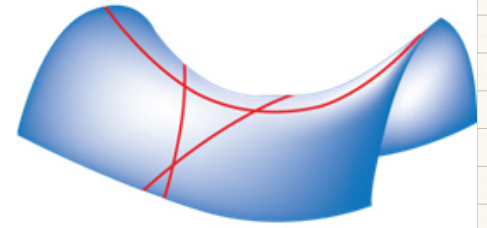


Euclidean



Spherical



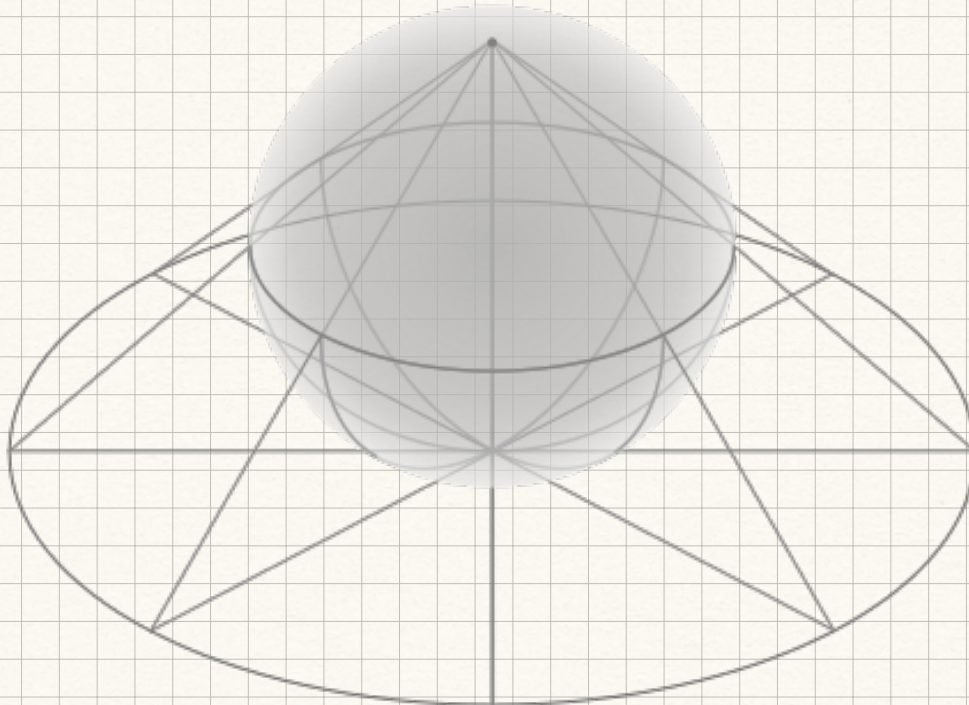
Hyperbolic



Euclidean



Non-Euclidean



- ✓ ① Mann + Dewey ...
- ✓ ② Consistency w Model?
- ✓ ★ ③ Intuitionists Correct? Not exactly... Gödel result depends on classical logic and infinite systems. (cf. Platonic Ideals vs. Human Constructs)
- ✓ ④ cf. Nirston Talk of imperfection in rendering or in modeling?
- ✓ ⑤ Turing Following the Science* w Euclides
- ✓ ⑥

Q1. Please give me any feedback that you think is necessary or appropriate.
 What do you mean by how to correctly argue from a picture?

Euclidean + Non-Euclidean Geometries

1. Axiomatic Basis of Euclidean Geometry - 360 B.C., 13 Books, 465 Theorems

Definitions

1. A *point* is that which has no part.
2. A *line* is breadthless length.
3. The extremities of a line are points.
4. A *straight line* is a line that lies evenly with the points on itself.
5. A *surface* is that which has length and breadth only.
6. The extremities of a surface are lines.
7. A *plane surface* is a surface that lies evenly with the straight lines on itself.
8. A *plane angle* is the inclination to one another of two lines in a plane that meet one another and do not lie in a straight line;
9. And when the lines containing the angle are straight, the angle is called *rectilinear*.
10. When a straight line set up on a straight line makes the adjacent angles equal to one another, each of the equal angles is *right*, and the straight standing on the other is called a *perpendicular* to that on which it stands.
11. An *obtuse angle* is an angle greater than a right angle.
12. An *acute angle* is an angle less than a right angle.

Common Notions

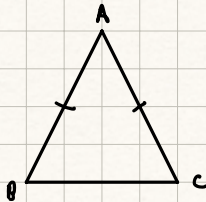
1. Things that are **equal** to the same thing are also equal to one another.
2. If equals be added to **equals**, the wholes are equal.
3. If equals be subtracted from **equals**, the remainders are equal.
4. Things that coincide with one another are **equal** to one another.
5. The whole is greater than the part.

The Postulates

1. To draw a straight line from any point to any point.
2. To produce a finite straight line continuously in a straight line.
3. To describe a circle with any center and distance.
4. That all right angles are **equal** to one another.
5. That, if a straight line falling on two straight lines make 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 are the angles less than two right angles.

2. Observations about Euclidean Geometry -

- **Congruent** means "the same" and is used to compare geometric objects, not numbers.
- **Equal** applies properly only to numerical quantities (so, only if we add the concept of measure to Euclidean Geometry).



$$\overline{AC} \cong \overline{AB}$$

OR

$$m\overline{AC} = m\overline{AB}$$

~~$$\overline{AC} = \overline{AB}$$~~

- Synthetic Geometry -