Axioms for some geometries:

| Euclidean | Spherical | Hyperbolic | |
|---|---|---|---|
| | | | Axiom 1A: Given any two points, there is one and only one straight line that contains both points. |
| | | | Axiom 1B: Given any two points, there is a straight line that contains both points, and given any 3 points there exists no more than one line that contains all of them |
| | | | Axiom 2: The complete straight line, the triangle and the circle separate the plane into two regions such that any line or arc of a circle joining a point in one region to a point in the other region intersects the separating figure. |
| | | | Axiom 3 part 1: Given a directed line containing a given point (A), and any line segment, there exists another point (B) and a segment between them that lies on the line in the given direction such that the segment ($\overline{AB}$) is congruent to the given line segment. |
| | | | Axiom 3 part 2: Given a directed line ($\overrightarrow{AB}$) and a side of the line containing another directed line or segment, and a given angle, there exists another directed line ($\overrightarrow{AC}$) with the same given point, on the given side, such that the angle between the lines ($\angle BAC$) is congruent to the given angle |
| | | | Axiom 4 (SAS): If two sides of one triangle are congruent to two corresponding sides of another triangle, and the angles contained by those sides congruent, then the triangles are congruent |
| | | | Postulate 5a (Parallels): Through a point not on a given line there exists at least two lines which do not meet the given line |
| | | | Postulate 5b (Parallels): Any two lines intersect at two points |
| | | | Postulate 5c (Parallels): Through a point not on a given line there exists at exactly one lines which does not meet the given line. |