Axioms for some geometries:

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| 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 () is congruent to the given line segment. |
|  |  |  | Axiom 3 part 2:Given a directed line () and a side of the line containing another directed line or segment, and a given angle, there exists another directed line () with the same given point, on the given side, such that the angle between the lines () 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 |
|  |  |  | Axiom 5a (Parallels): Through a point not on a given line there exists at least two lines which do not meet the given line |
|  |  |  | Axiom 5b (Parallels): Any two lines intersect at two points |
|  |  |  | Axiom 5c (Parallels): Through a point not on a given line there exists at exactly one lines which does not meet the given line. |

For each geometry and potential axiom, tell whether that axiom is true in that geometry