

# Statements Equivalent to the Parallel Postulate

1. A line that intersects one of the two parallel lines intersects the other also.
2. There exist lines that are everywhere equidistant from one another.
3. The sum of the angles of a triangle is equal to two right angles.
4. For any triangle, there exists a similar noncongruent triangle.
5. Any two parallel lines have a common perpendicular.
6. There exist a circle passing through any three noncollinear points.
7. Two lines parallel to the same line are parallel to each other.
8. The Saccheri right angle hypothesis is valid.
9. Playfair's Axiom is valid.
10. Rectangles exist.

## Statements True in Lobachevski Geometry But Not in Euclidean Geometry

1. Parallel lines are never equidistant
2. The Saccheri acute angle hypothesis is valid
3. The angle sum of a triangle is less than  $180^\circ$ .
4. Similar triangles are always congruent
5. Given a line L and a point P not on L, there exist at least two lines through P that are parallel to L.

Also see [Comparison Table for Euclidean and Non-Euclidean Geometry](#)