Parallel lines in Euclidean geometry

A quadrilateral in euclidean geometry is a parallelogram iff it has opposite pairs of sides parallel, iff it has opposite pairs of angles equals, iff it has one pair of opposite sides both parallel and equal, iff it has opposite pairs of sides equal.

Angle sum in a triangle is 180 degrees.

lines parallel to the same line are parallel to each other.

lines perpendicular to the same line are parallel, and vice versa, i.e. parallel lines always have a common perpendicular.

an exterior angle in a triangle equals the sum of the two remote interior angles.

the diagonals of a parallelogram bisect each other.

two parallel lines have a constant distance apart.

every saccheri quadrilateral is a rectangle.