

Extension of Proposition 23 from Euclid's Elements

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Proposition 23 states that two parallel lines in a plane never intersect. We use this definition with first and second postulate of Euclid to prove that two distinct lines through a single point cannot be parallel.

Proof:

Consider a point P . Let A and B be two points such that lines PA and PB are distinct from one another. So line PA does not contain B and line PB does not contain A . Therefore these two distinct lines have a common point P on them or they intersect at P . Therefore PA and PB are not parallel to one another.

Hence any two distinct lines that pass through the same point cannot be parallel to one another. A non-zero angle APB is always present between two such lines.