Diagonal Bisector Theorem

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Theorem . Suppose that the diagonals of rhombus ABCD cross. Then they bisect each other.

Proof. We learned from the Bulic-Maggert theorem that angle ABD is congruent to angle CDB. Similarly angle DCA is congruent to angle BAC. We also know that segment BD is congruent to segment AD. From this we know triangle ABE is congruent to triangle DCE by Euclid Proposition I.4. That means segment AE is congruent to segment CE, by corresponding sides of congruent triangles. Similarly, segment BE is congruent to segment DE. Diagonal DB splits AC into two segments through point E, causing them to bisect each other.
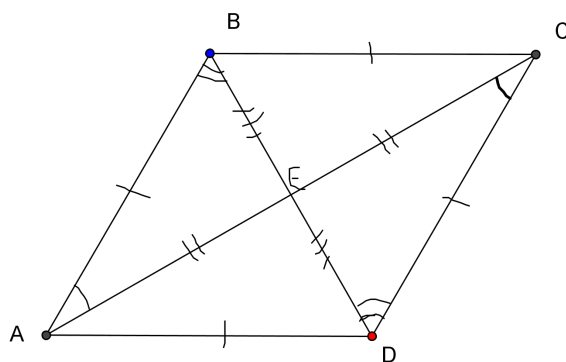

Figure 1: From the rhombus pictured we can see all the congruent angles and sides.

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