Creation of a Rhombus via Compass and Straightedge

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Theorem 1.4. Given line segment AB, rhombus ABCD may be created using only a compass and straightedge.

Proof. Construct circle with center A through B and circle with center B through A. Let one intersection of circle A and circle B be point C. Construct circle C through A. Let the intersection of circle A and circle C that is not point B be labeled point D. Construct circle D through A.

Draw line segment BC. Because point C lies on circle B through A, line segment BC is congruent to line segment AB by definition of a circle. Draw line segment CD. Because point D lies on circle C through B, line segment CD is congruent to line segment BC by definition of a circle. Since line segment AB is congruent to line segment BC, it is congruent to line segment CD as well. Draw line segment DA. Because point D lies on circle A through B, line segment AD is congruent to line segment AB by definition of a circle. Quadrilateral ABCD is formed of congruent line segments AB, BC, CD, DA, conforming to the definition of a rhombus.
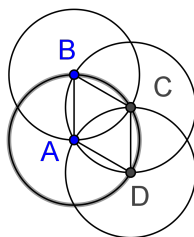

Figure 1: Quadrilateral ACBD

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