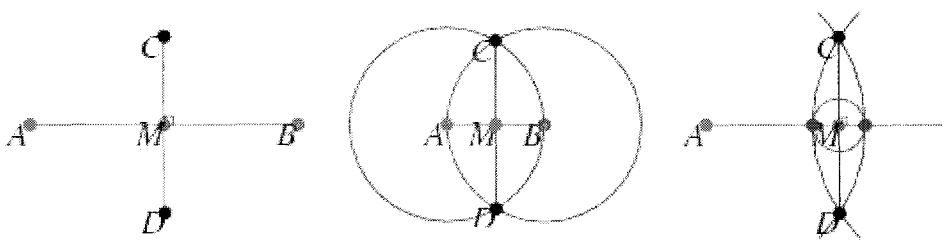
mathworld

Perpendicular Bisector



A perpendicular bisector *CD* of a line segment *AB* is a line segment perpendicular to *AB* and passing through the midpoint *M* of *AB* (left figure). Tl perpendicular bisector of a line segment can be constructed using a compass drawing circles centered at *A* and *B* with radius *AB* and connecting their two intersections. This line segment crosses *AB* at the midpoint *M* of *AB* (middle figure). If the midpoint *M* is known, then the perpendicular bisector can be constructed by drawing a small auxiliary circle around *M*, then drawing an arc from each endpoint that crosses the line *AB* at the farthest intersection of the circle with the line (i.e., arcs with radii AA' and BB' respectively). Connecti the intersections of the arcs then gives the perpendicular bisector *CD* (right figure). Note that if the classical construction requirement that compasses be collapsible is dropped, then the auxiliary circle can be omitted and the rigid compass can be used to immediately draw the two arcs using any radius larg that half the length of *AB*.