bon-db/geo/ZF5DD4.json (ISI B.Stat. 2006 P4)

Problem. In the figure below, E is the midpoint of the arc $ABEC$ and the segment ED is perpendicular to the chord BC at D. If the length of the chord AB is l_1, and that of the segment BD is l_2, determine the length of DC in terms of l_1, l_2.

Solution by **r1234** (#2 on the thread).

Solution. Suppose D' is a point on the ray AB, such that $BD = BD'$.Note that BE is the external angle bisector of $\angle ABC$.So $BE \perp DD'$.So $\angle BD'E = 90, ED' = ED$. Now $AE = EC$.So $\triangle AD'E$ and $\triangle EDC$ are congruent. So $CD = AD' = l_1 + l_2$. ■