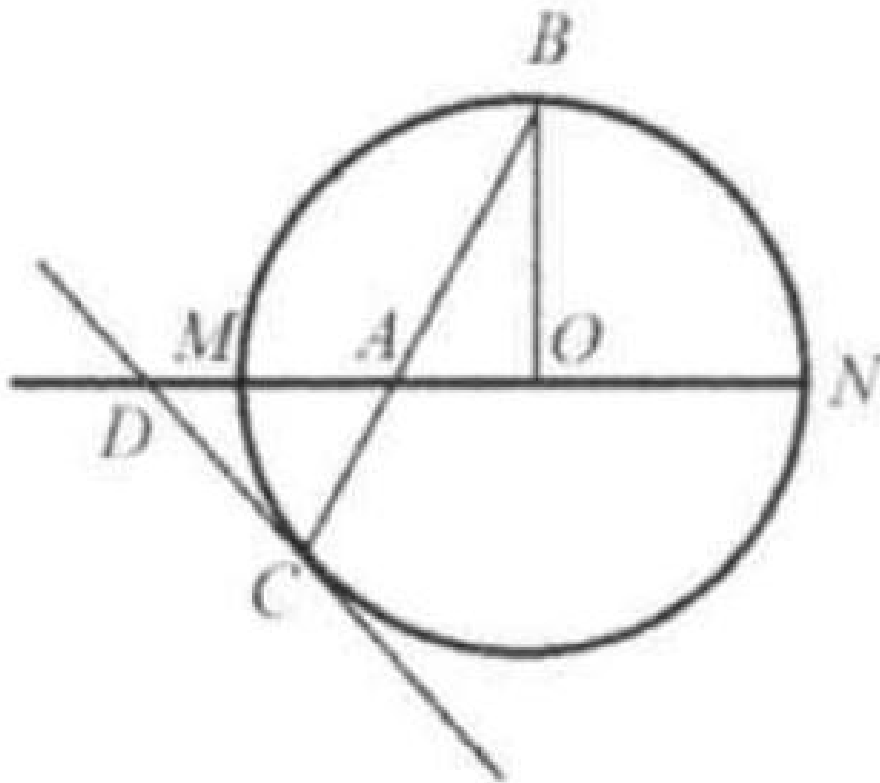


Problem

MN is the diameter of circle O . A is any point on MN . BC is a chord going through A . CD is the tangent to circle O at C , and meets the extension of NM at D . Prove: $DC = DA$ if $BO \perp MN$.



Solution

Connect OC . Since $OB = OC$, $\angle OBC = \angle OCB = \alpha$.

Since $BO \perp MN$ and $CD \perp OC$, $\angle DCO = \angle AOB = 90^\circ$,

We see that $\angle OAB = \angle DAC = 90^\circ - \alpha = \beta$ and $\angle DCA = 90^\circ - \alpha = \beta$.

Thus $\angle DCA = \angle DAC = \beta$, and $DC = DA$.

