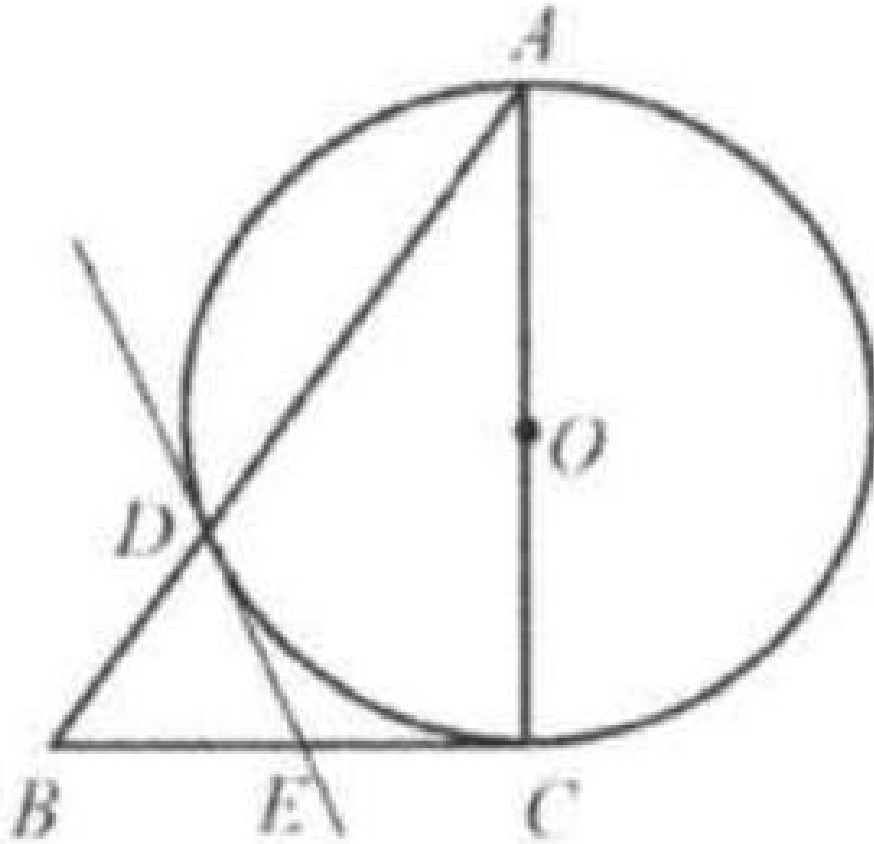


Problem 3

Problem

As shown in the figure, $\triangle ABC$ is a right triangle with $\angle C = 90^\circ$. AC is the diameter of circle O . Circle O meets the hypotenuse AB at D . Draw the tangent through D to the circle to meet the leg BC at E . Prove: $BE = EC$.



Solution

Connect CD .

Since AC is the diameter, $\angle ADC = 90^\circ$.

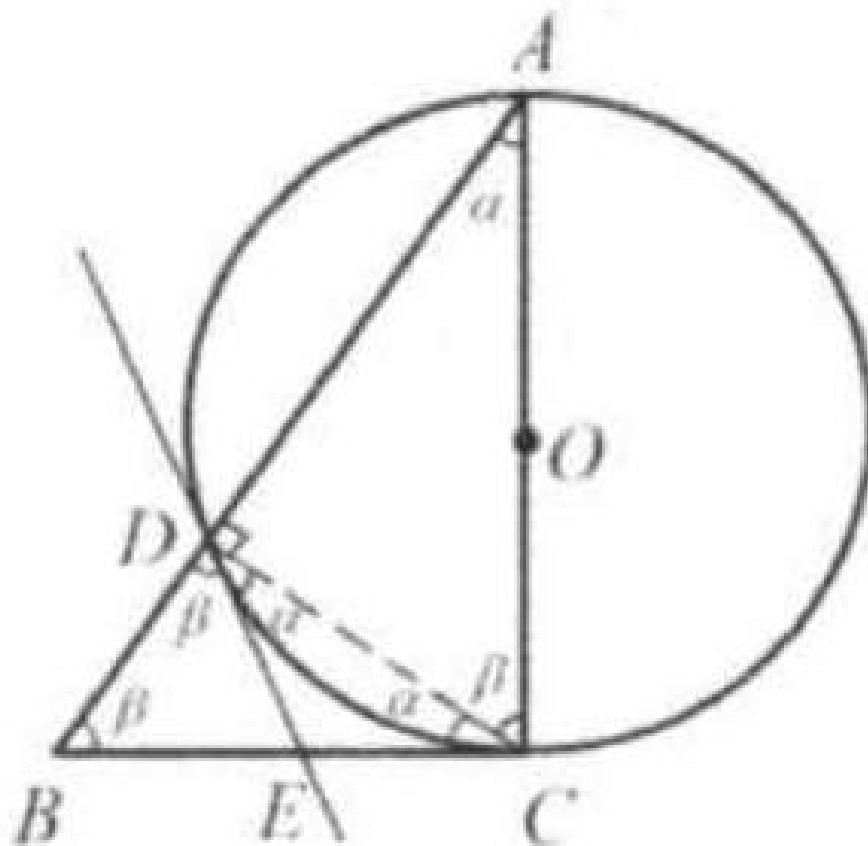
Let $\angle A = \alpha$, $\angle ACD = \beta$.

Then $\angle EDC = \angle ECD = \angle A = \alpha$ (they all face the same arc DC).

Since $\angle ACB = 90^\circ$, $\angle B = \beta$.

Since $\angle BDC = 90^\circ$, $\angle BDE = \beta$.

Note that both EC and ED are tangent to the circle O , ED



$= EC$.

Thus $DE = BE = EC$.