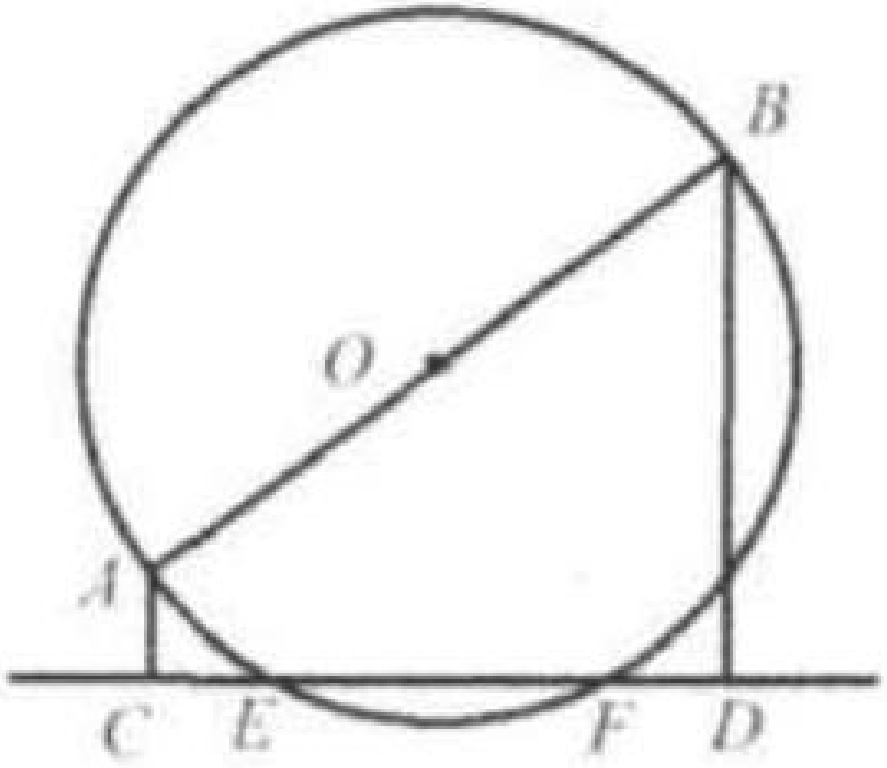
Example 12

AB is the diameter and EF is the chord of circle O.$AB = 10, EF = 6$. AC and BD are the distances from A, B to chord EF, respectively. Find the value of $AC + BD$.

Solution: 8.

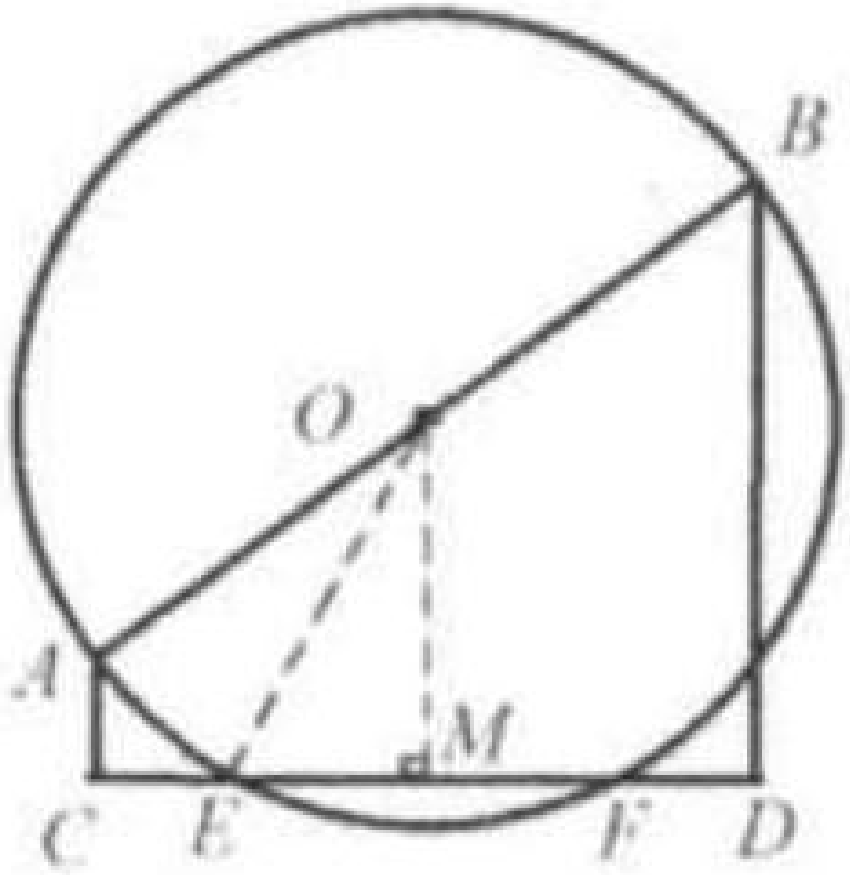
Connect OE. Take M, the midpoint of MN. Connect OM.



$OM \perp EF$. In $\triangle OME, OE = \frac{1}{2}AB = 5$.

$EM = \frac{1}{2}EF = 3$.

$OM = \sqrt{OE^2 - EM^2} = \sqrt{5^2 - 3^2} = 4$.



So OM is the median of trapezoid $ACDB$. Thus
$AC + BD = 2OM = 2 \times 4 = 8$.