QUESTION 9
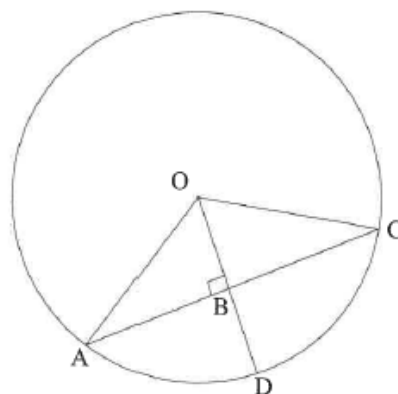
9.1 In the figure, O is the centre of the circle. A, B, C, D and E lie on the circle such that chord AB and chord DC are equal in length and $A\hat{E}B = 39°$.
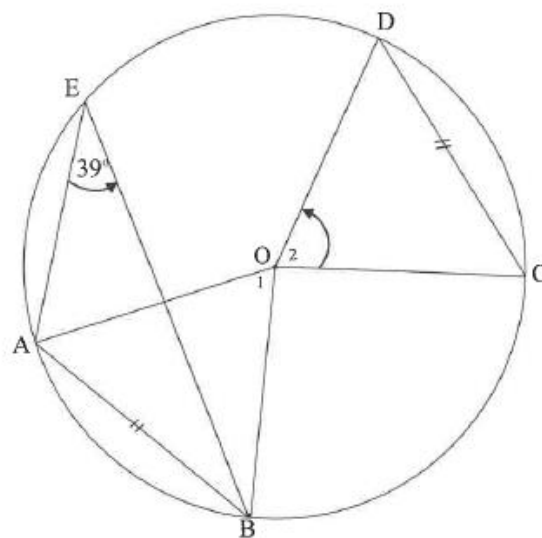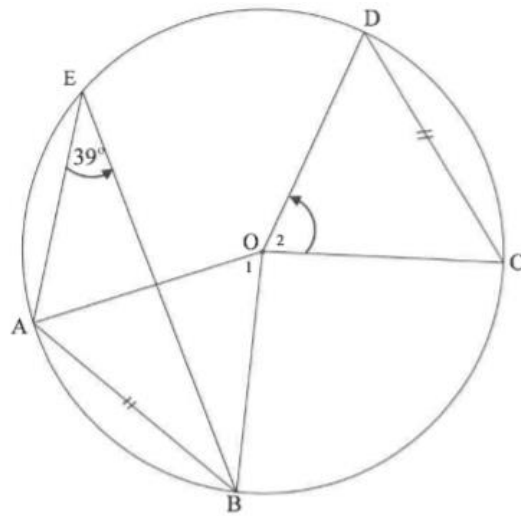

9.1.1 Determine the size of $\hat{O}_1$. (2)

9.3 In the diagram, O is the centre of the circle. Chord AC is perpendicular to radius OD at B. OB = 2x units and AC = 8x units.
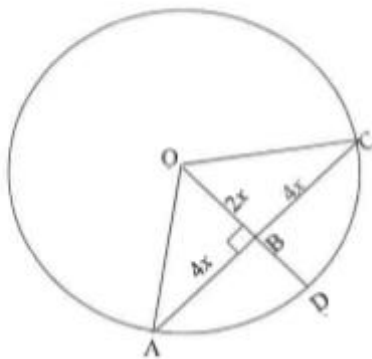

Show that the length of BD is $2x\left(\sqrt{5}-1\right)$ units. (5)

9.1.1	$\hat{O}_1 = 78°$ [angle at centre $= 2 \times \angle$ at circumference] $[middelpuntshoek = 2 \times omtrekshoek]$	✓S ✓R (2)

9.3	$AB = BC = 4x$ $\begin{bmatrix} \text{line from centre} \perp \text{to chord/} \\ lyn\,van\,middelpunt \perp aan\,koord \end{bmatrix}$ $OA^2 = (4x)^2 + (2x)^2$ [Pythagoras] $OA = \sqrt{16x^2 + 4x^2}$ $= \sqrt{20x^2}$ $= 2\sqrt{5}\,x$ $OD = OA = 2\sqrt{5}\,x$ [radii] $BD = 2\sqrt{5}\,x - 2x$ $= 2x(\sqrt{5} - 1)$	✓S ✓R ✓ Substitution/ vervanging ✓ length of OA / lente van OA ✓ $BD = 2\sqrt{5}\,x - 2x$ (5)