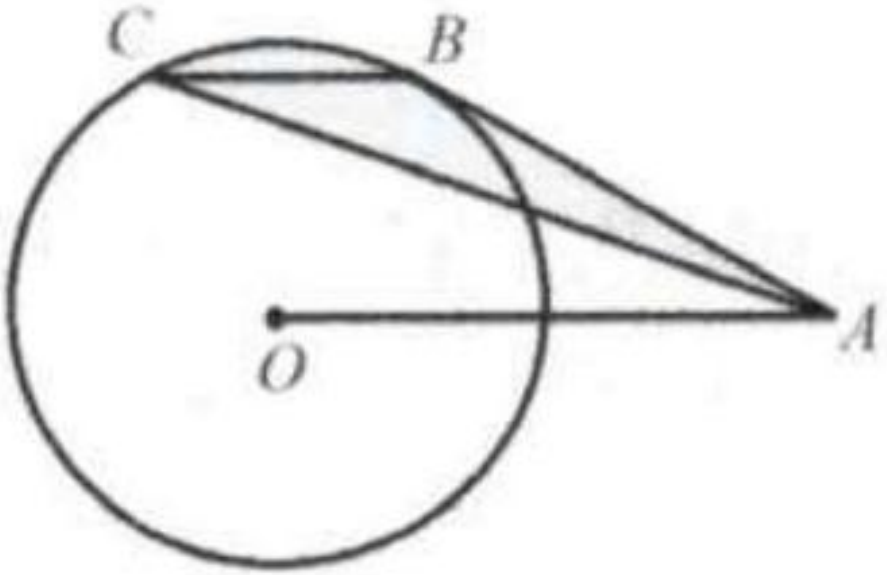
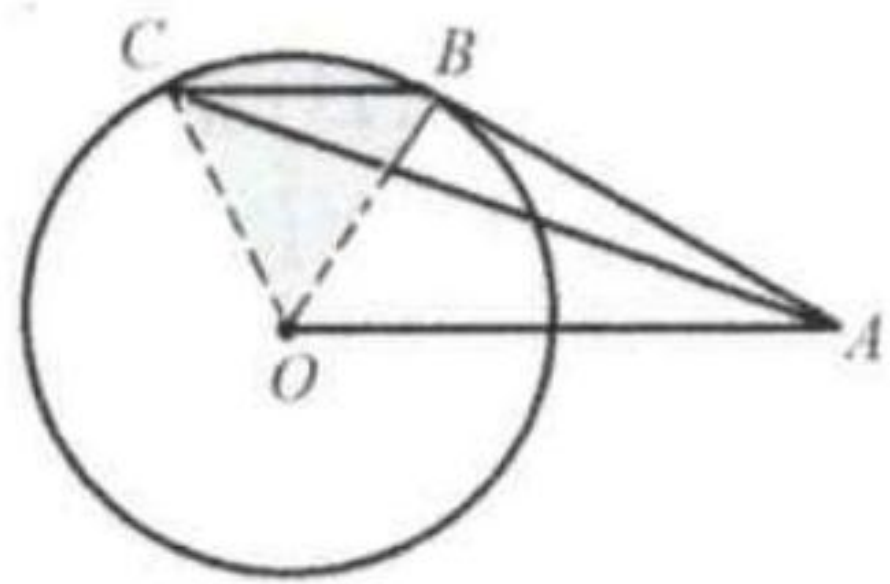
Example 11

A is a point outside the circle O of radius 1. $OA = 2.AB$ is tangent to the circle at B. Chord $BC//OA$. Connect AC. Find the shaded area.

Solution: $\frac{\pi}{6}$.



Connect OB, OC. Since $BC//OA, S_{\triangle OBC} = S_{\triangle ABC}$.
Thus the shaded area is the same as the area of the sector OBC.
Since AB is tangent to the circle, $OB \perp AB$.



In right triangle $AOB, AO = 2, OB = 1$. So $\angle AOB = 60°$. So $\angle BOC = 60°$.
The shaded area = the area of the sector OBC $= \pi \times \frac{1}{6} = \frac{\pi}{6}$.