G-CO Inscribing a hexagon in a circle

Task

Let $C$ be a circle with center $O$ and a diameter meeting $C$ in points $P$ and $S$ as shown below:

![Diagram of a circle with points S, O, and P]

a. With straightedge and compass, show how to find a point $Q$ on $C$ so that triangle $OPQ$ is equilateral.

b. Repeating part (a) show how to find points $R, T, U$ on $C$ so that $PQRSTU$ is a regular hexagon.

c. Find the area of $PQRSTU$. How does it compare to the area of $C$?