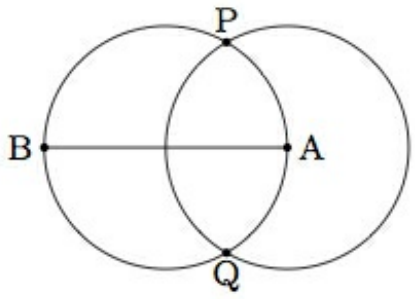
G-CO Inscribing an equilateral triangle in a circle

Task

Suppose we are given a circle of radius r. The goal of this task is to construct an equilateral triangle whose three vertices lie on the circle. Suppose $\overline{AB}$ is a diameter of the circle. Draw a circle with center A and radius r and label the two points of intersection of the circles P and Q as pictured below:



a. Show that $m(\angle ABP) = 30$ and $m(\angle ABQ) = 30$.

b. Show that $\triangle PBQ$ is an equilateral triangle inscribed in the given circle.