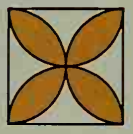
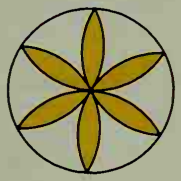
24. $ABCD$ is a square with sides 8 cm long. Two circles each with radius 8 cm are drawn, one with center A and the other with center C. Find the area of the region inside both circles.

25. Two circles have radii 6 cm and their centers are 6 cm apart. Find the area of the region common to both circles.

26. **a.** Draw a square. Then construct the figure shown at the right.
b. If the radius of the square is 2, find the area of the shaded region.

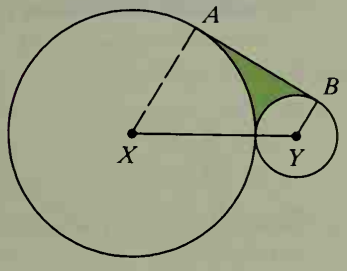


C **27.** **a.** Using only a compass, construct the six-pointed figure shown at the right.
b. If the radius of the circle is 6, find the area of the shaded region.

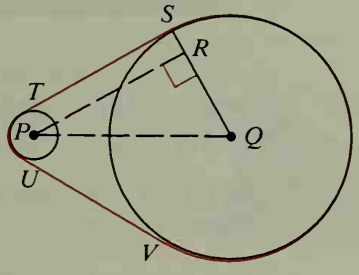


28. Three circles with radii 6 are tangent to each other. Find the area of the region enclosed between them.

★ **29.** Circles X and Y, with radii 6 and 2, are tangent to each other. $\overline{AB}$ is a common external tangent. Find the area of the shaded region. (*Hint*: What kind of figure is $AXYB$? What is the measure of $\angle AXY$?)



Ex. 29

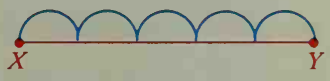


Ex. 30

★ **30.** The diagram at the right above shows a belt tightly stretched over two wheels with radii 5 cm and 25 cm. The distance between the centers of the wheels is 40 cm. Find the length of the belt.

Challenge

Here $\overline{XY}$ has been divided into five congruent segments and semicircles have been drawn. But suppose $\overline{XY}$ were divided into millions of congruent segments and semicircles were drawn. What would the sum of the lengths of the arcs be?



Sarah says, "XY, because all the points would be so close to $\overline{XY}$." Mike says, "A really large number, because there would be so many arc lengths to add up." What do you say?