Lesson 10-7

Example 1

Construct a regular octagon.

Solution

Step 1: Begin with a circle and mark off 4 equal arcs.

Step 2: Connect each point to the center of the circle. You now have 4 central angles that are congruent.
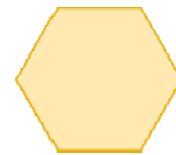
Step 3: Bisect 2 consecutive central angles. Extend each bisector so that it intersects the circle on two sides. You should now have 8 equally spaced points on the circle.

Step 4: Connect each point to the one next to it with a straight line segment. The resulting figure is a regular octagon.
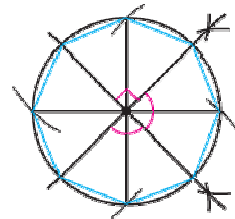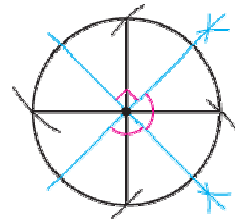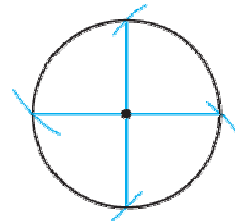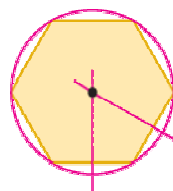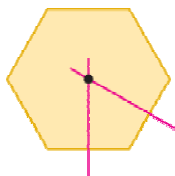
Example 2

Inscribe this regular hexagon in a circle.

Solution

To inscribe any regular polygon, construct the perpendicular bisector of any two of its sides. The point of intersection of the bisectors becomes the center of the circle. The radius of the circle is the distance from the center to any vertex of the polygon.
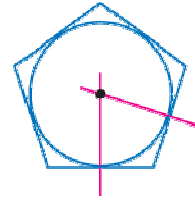
Example 3

Inscribe a circle in a regular pentagon.

Solution

To locate the point that will become the center of the
circle, find the intersection of the perpendicular bisectors
of any two sides. To find the radius of the circle, use the
distance from the center of the circle along a
perpendicular bisector to a side of the pentagon. Draw a
circle.

Example 4

ARCHITECTURE An architect is rebuilding a home after
a storm. She has found a part of a window sill that may have
been above the front door. How can she figure out the size
of the original window from this fragment?

Solution

The perpendicular bisector of a chord passes through the center of a circle. To complete the
circle, begin by drawing two chords. Construct the perpendicular bisector of each. The point
where the bisectors intersect must be the center of the circle. use the center of the circle and
the radius to complete the circle.