# Construction Techniques 5: Squares

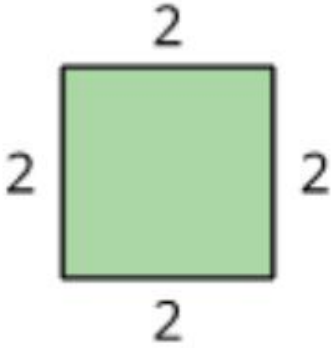
Illustrative Mathematics®

# Learning Goal


Let’s use straightedge and compass moves to construct squares.

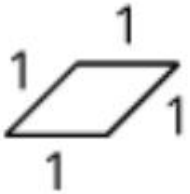
# 7.1 Which One Doesn't Belong: Polygons

A.

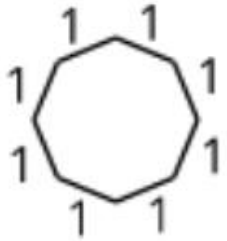



B.


C.

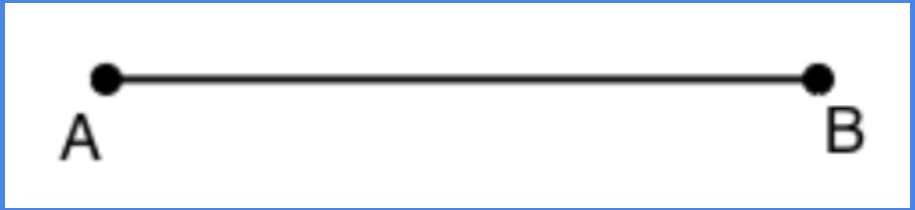



D.

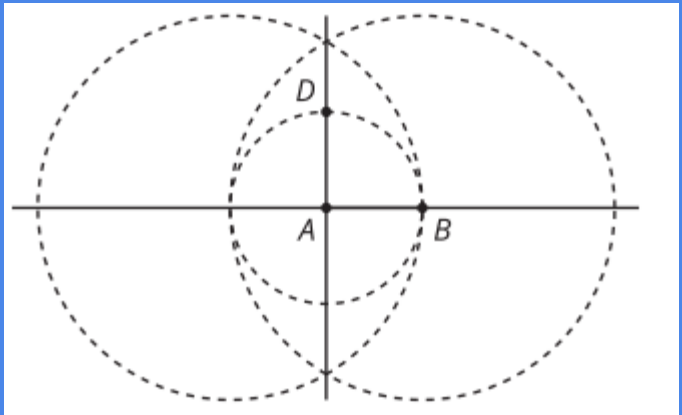


# 7.2 It's Cool to Be Square

Use straightedge and compass tools to construct a square with segment *AB* as one of the sides.



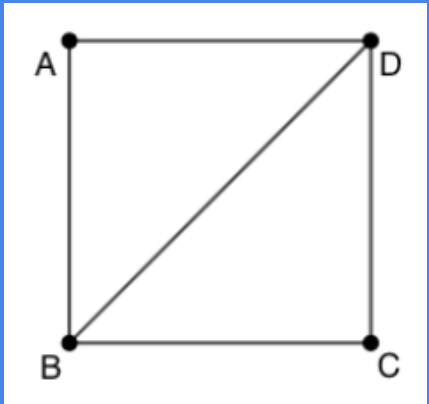
# Activity Synthesis




How do you know that what you constructed is a square?

# 7.3 Trying to Circle a Square

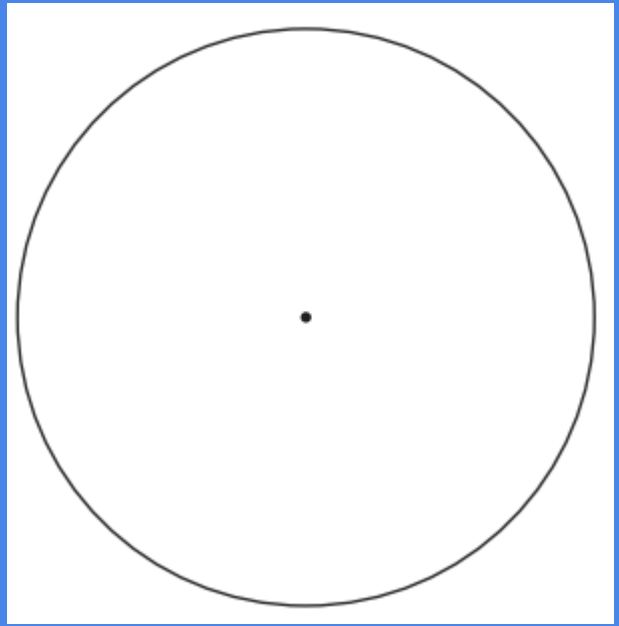
1. Here is square *ABCD* with diagonal *BD* drawn:



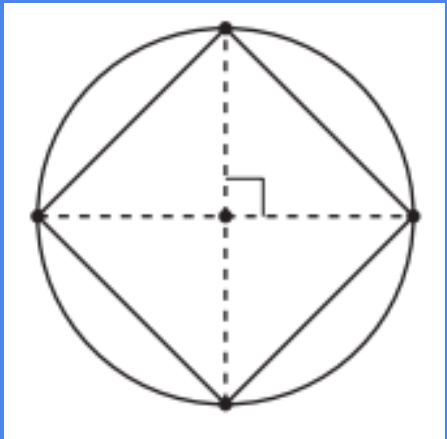

a. Construct a circle centered at *A* with radius *AD*.
b. Construct a circle centered at *C* with radius *CD*.
c. Draw the diagonal *AD* and write a conjecture about the relationship between the diagonals *BD* and *AC*.
d. Label the intersection of the diagonals as point *E* and construct a circle centered at *E* with radius *EB*. How are the diagonals related to this circle?

# 7.3 Trying to Circle a Square

2. Use your conjecture and straightedge and compass moves to construct a square inscribed in a circle.



# Activity Synthesis



How was this construction different from the square in the previous activity?

Conjecture that the entire construction remains the same even when rotated ¼ of a full turn (90 degrees) around the center. This means that each side can be rotated onto the other sides, and each angle can be rotated onto the other angles.

# Lesson Synthesis

We have now constructed:

- Equilateral triangle
- Regular hexagon
- square

All inscribed in a circle.

These are all **regular polygons,** which is a polygon with all congruent sides and all congruent angles.

Starting with any of these shapes, which construction techniques would help you make other regular polygons inscribed in circles?