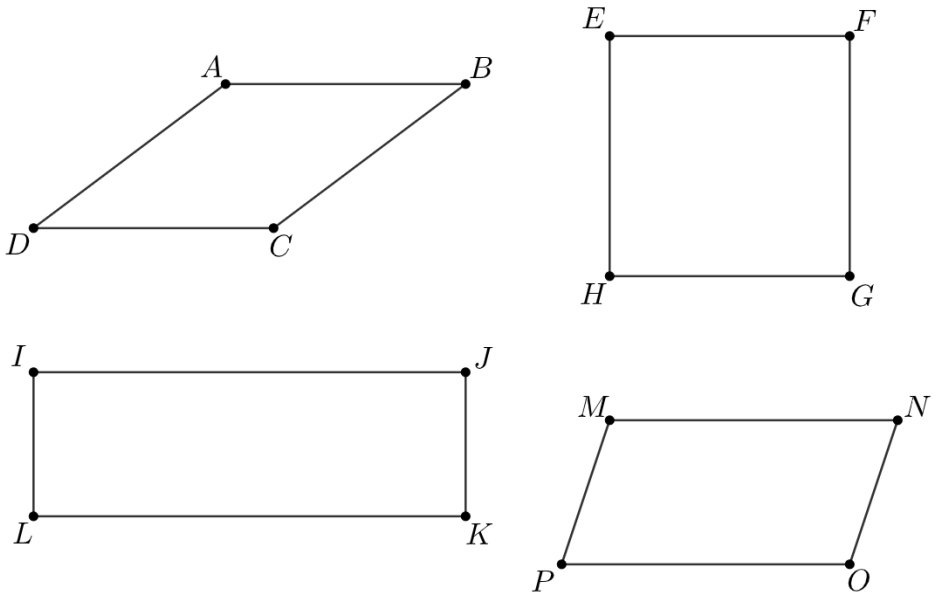
Name: _____

Lesson 1.05
Squares

Geometry GT

Recall

For each figure below, determine what type of quadrilateral it is.

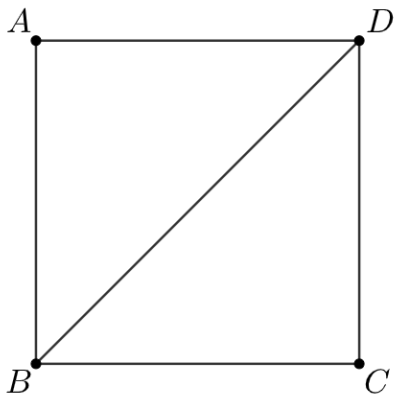


Explore

Use straightedge and compass moves to construct a square with segment $\overline{AB}$ as one of the sides.

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

Here is square $ABCD$ with diagonal $\overline{BD}$ drawn.

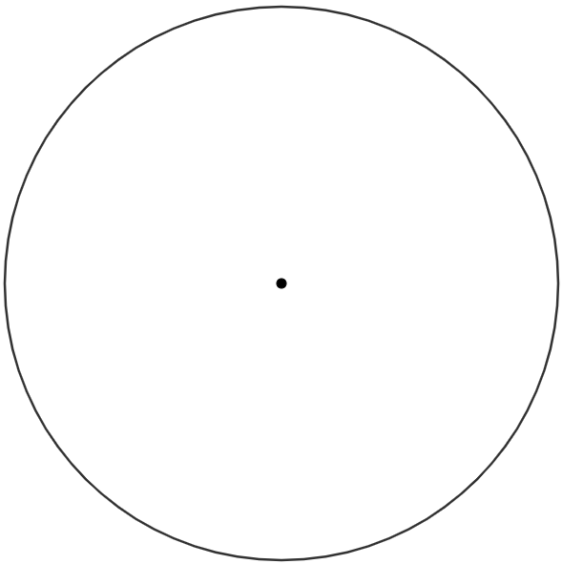


First, construct a circle centered at A with radius AD and another circle centered at C with radius CD. Then draw the diagonal $\overline{AC}$. Write a conjecture about the relationship between diagonals $\overline{BD}$ and $\overline{AC}$.

Label the intersection of the diagonals as point E and construct a circle centered at E with radius BE. How are the diagonals related to this circle?

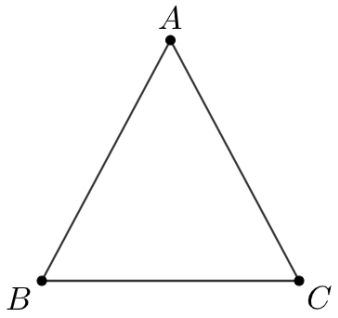
Discuss

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



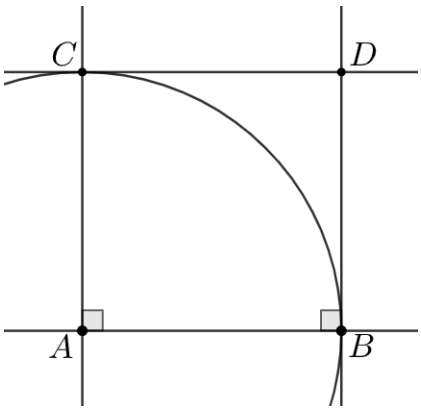
Demonstrate

Use compass and straightedge moves to construct a square with segment $\overline{BC}$ as one of the sides.



Practice

1. This diagram is a straightedge and compass construction of a square $BACD$ (not all markings are shown). The construction followed these steps:



A. Start with two marked points A and B

B. Use a straightedge to construct line $\overleftrightarrow{AB}$

C. Use a previous construction to construct a line perpendicular to $\overleftrightarrow{AB}$ passing through A

D. Use a previous construction to construct a line perpendicular to $\overleftrightarrow{AB}$ passing through B

E. Use a compass to construct a circle centered at A passing through B

F. Label an intersection point of that circle and the line from step **C** as C

G. Use a previous construction to construct a line parallel to $\overleftrightarrow{AB}$ passing through C

H. Label the intersection of that line and the line from step **D** as D

I. Use a straightedge to construct the segments $\overline{AC}$, $\overline{CD}$, and $\overline{BD}$

Explain why you need to construct a circle in step **E**.

2. Which of these statements is true?

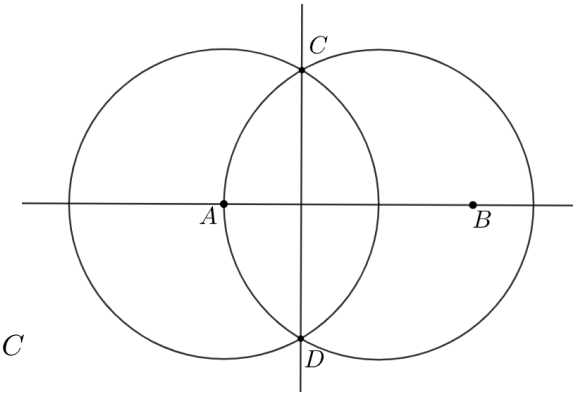
A. All rectangles are regular polygons

B. All squares are regular polygons

C. All rhombi are regular polygons

D. All parallelograms are regular polygons

3. To construct a line passing through the point C that is parallel to the line $\overleftrightarrow{AB}$, the first step is to create a line through C perpendicular to $\overleftrightarrow{AB}$. What is the next step?



A. Construct an equilateral triangle with side $\overline{CD}$

B. Construct a line through point B perpendicular to $\overleftrightarrow{AB}$

C. Construct a segment with length AB with endpoint C

D. Construct a line through point C perpendicular to $\overleftrightarrow{CD}$