

**Lesson 1.08 Constructions (Copy Segment, Midpoint, & Perpendicular Bisector)**



Students will be able to:

- Content Objective: Copy segments and construct circles, midpoints, perpendicular bisectors, and angle bisectors.
- Language Objective: Discuss the ratio of segments given constructions.



**Warm Up**

Explain, in words, the difference between a segment bisector and a perpendicular bisector.



**Vocabulary Review**

Fill in the blanks with the correct vocabulary words from the word bank.

- A \_\_\_\_\_ bisector intersects a segment at its midpoint and divides the segment into two congruent segments.
- A \_\_\_\_\_ is a point that divides a segment into two congruent segments.
- A \_\_\_\_\_ bisector, intersects a segment at the midpoint and forms angles that have a measure of  $90^\circ$ .
- An \_\_\_\_\_ bisector divides an angle into two congruent angles.
- An \_\_\_\_\_ triangle has three congruent sides and three congruent angles.

**Word Bank**

- Perpendicular
- Midpoint
- Equilateral
- Angle
- Segment



**Graphic Organizer**

<p><b>Compass</b></p> <p>A geometric instrument used for constructing circles and arcs.</p>	
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**Constructing Circles**


1. Place center of compass on the center point of the circle.
2. Stretch the radius to measure desired length.
3. Construct circle.


**Skill 1: Constructing Circles**

Given point  $A$  below, construct circle  $A$  with a radius of  $1.5\text{ in}$  using a compass and measurement.

$A$


**Exercise 1: Constructing Circles**

Given point  $A$  below, construct circle  $P$  with a radius of  $2\text{ in}$  using a compass and measurement.

$P$

**Copying Segments**

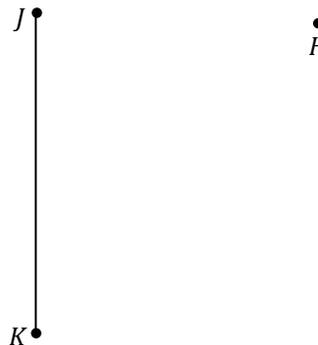

1. Place compass on endpoint of segment and stretch radius to measure length.
2. Using a ruler, draw a segment longer than the one you are copying.
3. Place compass on new endpoint and draw arc.
4. Mark intersection point.


**Skill 2: Copying Segments**

Given  $\overline{CD}$  below, copy its length and construct  $\overline{C'D'}$  such that  $\overline{CD} \cong \overline{C'D'}$ .


**Exercise 2: Copying Segments**

Given  $\overline{JK}$  below, copy its length and construct  $\overline{HI}$  such that  $\overline{JK} \cong \overline{HI}$ .



**Midpoint & Segment Bisector**

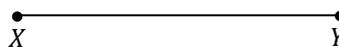
1. Place compass on one endpoint and stretch radius more than half the length of the segment you wish to bisect.
2. Without moving the compass, create a semi-circle, intersecting the segment.
3. Without moving the radius, repeat step 2 at the other endpoint and mark the intersection points.
4. Connect the intersection points with a line. This is called the **perpendicular bisector**.
5. Label the point of intersection the line makes with the segment. This is called the **midpoint**.

**Skill 3: Midpoint & Perpendicular Bisector**

Given  $\overline{LM}$  below, construct the perpendicular bisector and label the midpoint  $O$ .

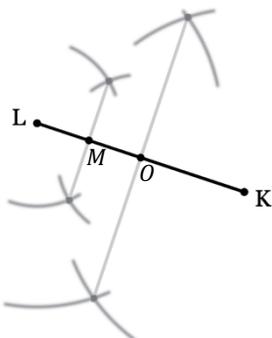
**Exercise 3: Midpoint & Perpendicular Bisector**

Given  $\overline{XY}$  below, construct the perpendicular bisector and label the midpoint  $M$ . Then bisect  $\overline{XM}$  and label the point  $Q$ . What length is  $\overline{XQ}$  compared to  $\overline{XY}$ ?

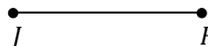
**Talk it Out**

Jehny used her knowledge of constructions to construct point  $M$  as shown below. Based on her constructions, which statement is true?

- 1)  $2 \cdot LM = LK$
- 2)  $LM = \frac{1}{4} \cdot LK$
- 3)  $OM = OL$
- 4)  $LM = 4 \cdot LK$

**Check Point**

Given  $\overline{JF}$  below, use your knowledge of constructions to construct  $\overline{J'F'}$  such that  $2 \cdot JF = J'F'$ .



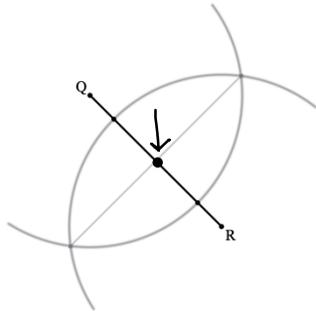


1.08- Problem Set

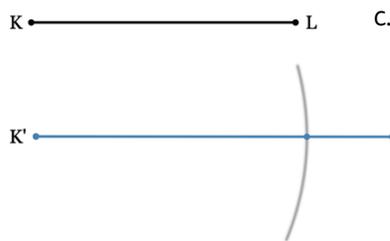
Name: \_\_\_\_\_

1. Name the construction shown in each of the following images below.

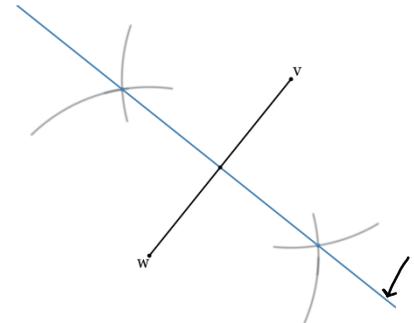
a.



b.



c.

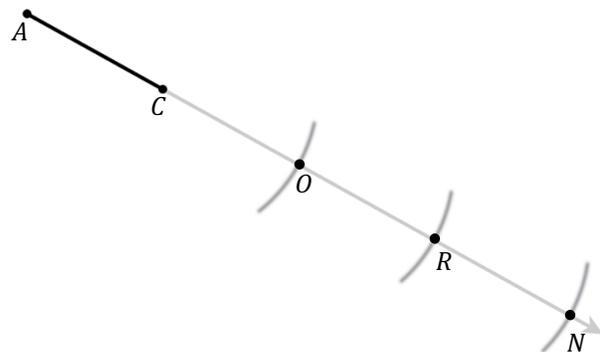


2. Given  $\overline{IN}$  below, construct the perpendicular bisector and label the midpoint  $M$ .



3. Anya constructed the following illustration shown below.

a. What construction did Anya use repeatedly?



b. What is true about  $\overline{RN}$  and  $\overline{AC}$ ?

c. What does point  $O$  represent on  $\overline{AN}$ .

d. Fill in the blank below.

\_\_\_\_\_  $\cdot AC = AN$