Geometry: Unit 2

Segments, Rays, and Distance

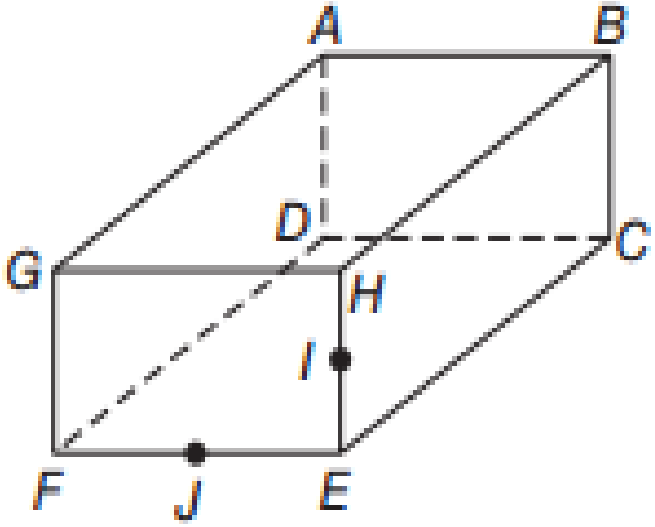
Warm-up

Refer to the figure.

4. Name the three line segments that intersect at point *A*.

5. Name the line of intersection of planes *GAB* and *FEH*.

6. Do planes *GFE* and *HBC* intersect? Explain.



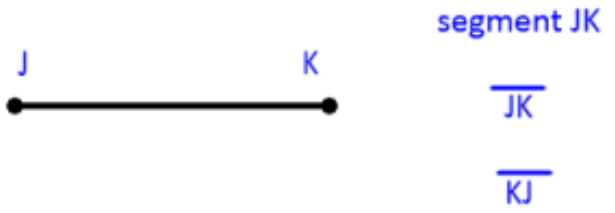
Segments, Rays, and Distance

- **Content Objective:** Students will be able to complete statements and answer problems related to line segments using the Segment Addition Postulate.

- **Language Objective:** Students will be able to state and use the Segment Addition Postulate to solve problems.

Segments and Rays

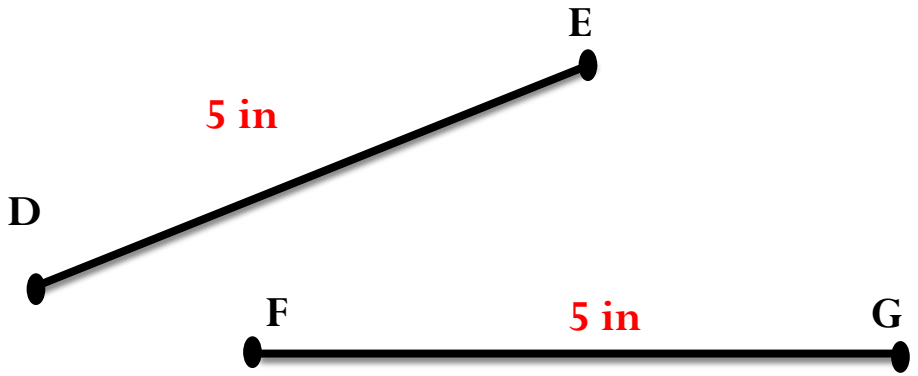
- Here is a reminder of the definitions, along with visual examples, of segments and rays, discussed in the previous lecture.

word	definition	drawing/example
segment	a part of a line that has two endpoints	
ray	part of a line that has one endpoint goes on forever in one direction	

- **Note**: Since Segments have a fixed distance, then we can give a measure to it.

Congruence

- In geometry, two objects that have the same size and shape are called **congruent.**
- **Congruent segments** are segments that have equal lengths.
- **Example**: To indicate that $\overline{DE}$ and $\overline{FG}$ have equal lengths, we write $\boldsymbol{DE = FG}$.



- To indicate that $\overline{DE}$ and $\overline{FG}$ are congruent, we write

$$\overline{DE} \cong \overline{FG}$$

Midpoint and Bisector

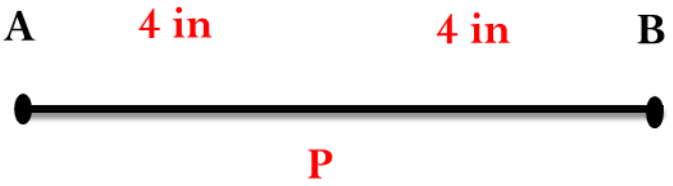
- The **midpoint of a segment** is the point that divides the segment into two congruent segments.

- From the diagram, we see that:

  $AP = PB$

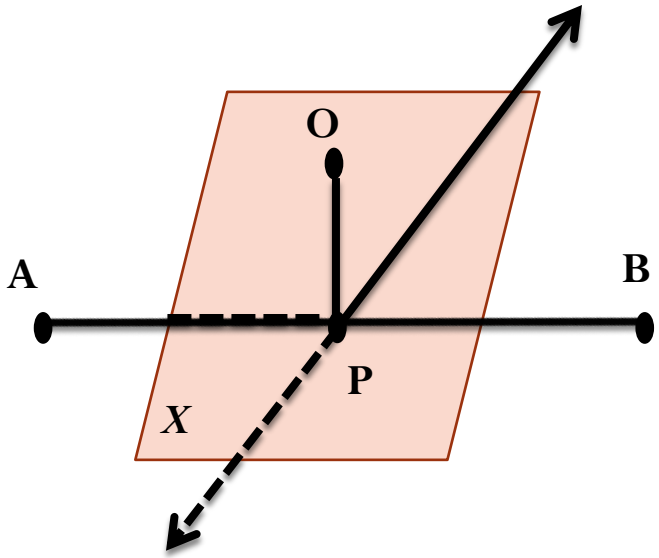
  So $\overline{AP} \cong \overline{PB}$

  Thus, P is the midpoint of $\overline{AB}$



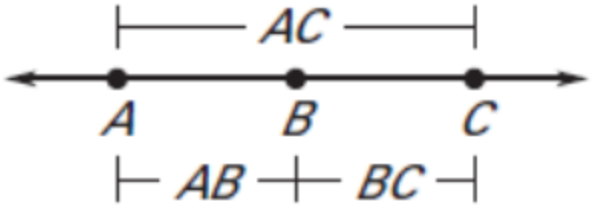
Segment Bisector

- A **bisector of a segment** is a line, segment, ray, or plane that intersects the segment at its midpoint.
- From the diagram, you can see that Line *l* is the bisector of $\overline{AB}$. $\overline{PQ}$ and plane *X* also bisect $\overline{AB}$.



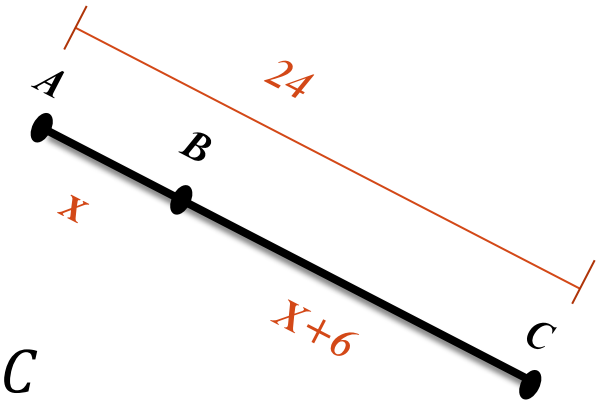
Segment Addition

- ***Segment Addition Postulate:***
  - If ***B*** is between ***A*** and ***C***, then $AB + BC = AC$.



Example Using Segment Addition

B is between ***A*** and ***C,*** with $\boldsymbol{AB = x}$, $\boldsymbol{BC = x + 6}$, *and* $\boldsymbol{AC = 24}$. Find:



- a) the value of x.

By the Segment Addition Postulate, we can write

$$AB + BC = AC$$

$$x + (x + 6) = 24$$

$$2x + 6 = 24$$

$$2x = 18$$

$$x = 9$$

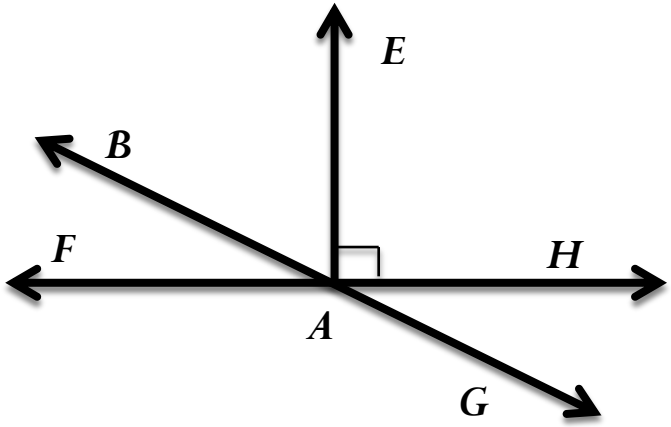
- b) BC

With the value of x we got in part (a), we can plug it in to find the value of BC

$$BC = x + 6$$
$$= 9 + 6$$
$$= 15$$

Exit Ticket

- Refer to the diagram and complete the statement and solve the problem.



- 1. $\overrightarrow{BG}$ is the segment _____ of $\overline{FH}$ passing through _____ A creating _____ segments AF and AH.
- Using the above statement, Find the values of AF and AH if $FH = 42$.