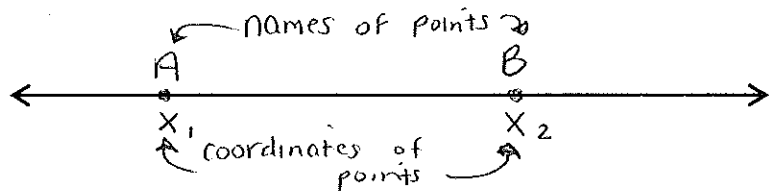


Section 1.5: Segments and Their Measures

Points on a line can be matched with numbers on a number line.

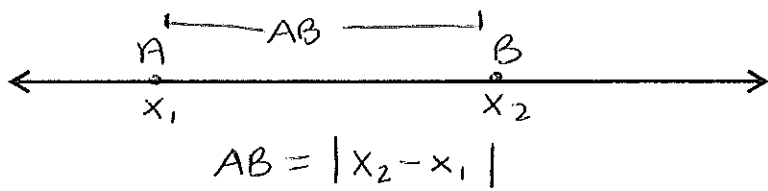
The number that corresponds to a point is the coordinate of the point.



The distance between points A and B is written as AB.

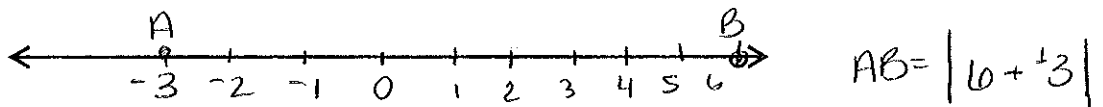
It is the absolute value of the difference in the coordinates of A and B.

AB is also called the length of \overline{AB} .



Example:

Find the length of \overline{AB} if point A is at a coordinate of -3 and point B is at a coordinate of 6.



AB = 9 units

Notice the difference in the notation.

line	\overleftrightarrow{AB}	} figures
segment	\overline{AB}	
ray	\overrightarrow{AB} or \overrightarrow{BA}	
length	AB	} value (number)

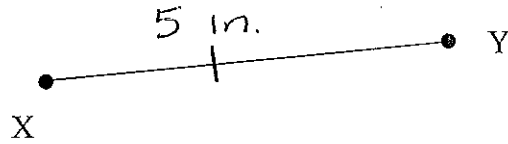
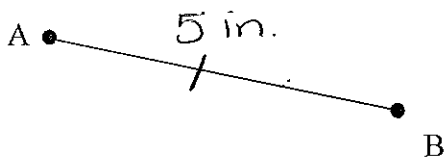
Segments that have the same length are called congruent segments.

The symbol for congruence is: \cong

The symbol for equal is: $=$

How do I know when to use which one?

Use \cong when comparing figures. Use $=$ when comparing length.

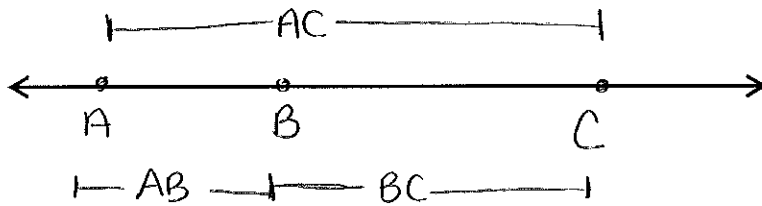


$$\overline{AB} \cong \overline{XY}$$

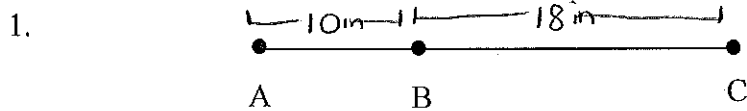
$$AB = XY$$

Segment Addition Postulate

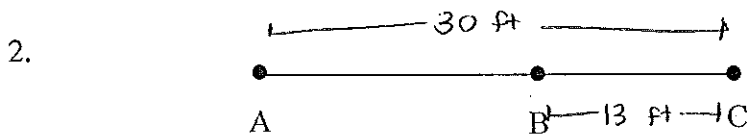
If B is between A and C, then $AB + BC = AC$.



Examples:



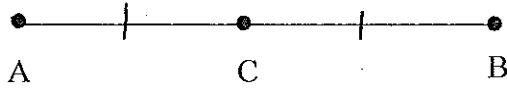
If $AB = 10$ inches and $BC = 18$ inches, then $AC =$ 28 in.



If $AC = 30$ feet and $BC = 13$ feet, then $AB =$ 17 ft.

Section 2.1: Segment Bisectors

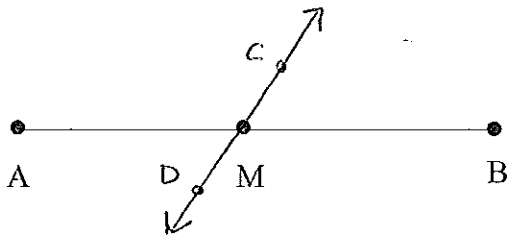
The midpoint of a segment is the point that divides it into two congruent segments.



If C is the midpoint of \overline{AB} , then $\overline{AC} \cong \overline{CB}$ and $AC = CB$.

A segment bisector is a segment, ray, line, or plane that intersects a segment at its midpoint.

To bisect a segment means to divide the segment into to congruent segments.

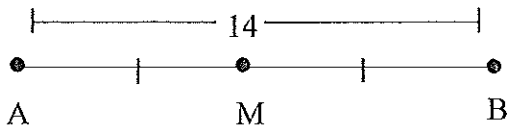


M is the midpoint
 \overleftrightarrow{CD} is the segment bisector

* a midpoint is never a segment bisector.

Examples:

1.



M is the midpoint of \overline{AB} . Find AM and MB.

AM = 7 MB = 7

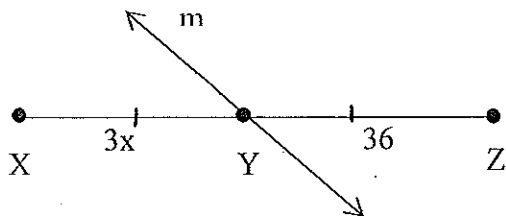
2.



P is the midpoint of \overline{LM} . Find LP and PM.

LP = 10 PM = 5

3.



$$\frac{3x}{3} = \frac{36}{3}$$

$$x = 12$$

Line m is a segment bisector of \overline{XZ} . Find the value of x , then find XY , YZ , and XZ .

$x =$ 12 $XY =$ 36 $YZ =$ 36 $XZ =$ 72

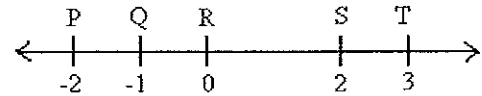
Homework

1) Does the symbol represent a line, segment, ray, or length?

- a. \overline{PQ} segment b. \overrightarrow{PQ} ray c. \overleftrightarrow{PQ} line d. PQ length

Determine whether the given segments are congruent. Use the diagram to the right.

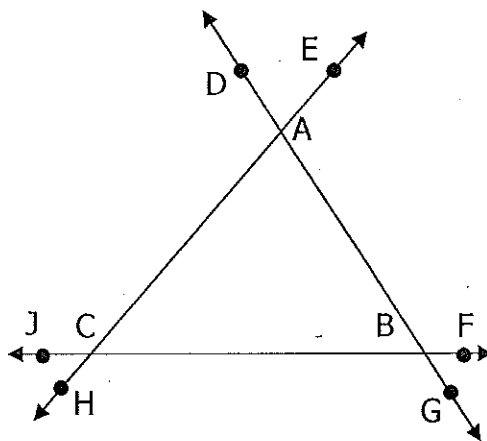
- a. $\overline{PR} \cong \overline{ST}$ no b. $\overline{QS} \cong \overline{RT}$ yes c. $\overline{PS} \cong \overline{QT}$ yes



- 2) Name the ray opposite to \overrightarrow{SP} . \overrightarrow{ST}
- 3) Name the midpoint of \overline{PS} . point R

Complete each statement as true or false.

- false 4) C is between A and B.
- true 5) \overrightarrow{AD} and \overrightarrow{AB} are opposite rays.
- true 6) \overline{CB} is the same as \overline{BC} .
- false 7) \overrightarrow{CB} is the same as \overrightarrow{BC} .
- true 8) \overleftrightarrow{CB} is the same as \overleftrightarrow{BC} .
- false 9) \overline{CB} is the same as \overleftrightarrow{BC} .
- true 10) \overleftrightarrow{JF} is the same as \overleftrightarrow{CB} .
- true 11) \overrightarrow{BA} is the same as \overrightarrow{BD} .



In the diagram, $\overline{AC} \cong \overline{CE}$ and B is the midpoint of \overline{AC} . $CD = 2$ and $AB = 3$.

- 3 12) Find BC.
- 6 13) Find AC.
- 4 14) Find DE.

