

Measuring Segments

Lesson Objective: INBAT find lengths of segments using the Ruler Postulate and the Segment Addition Postulate.

Finding the distance between two points on a number line is relatively *trivial*, which means it is something that we accept without much proof needed to verify. This is what we call a postulate or an axiom in Geometry.

Ruler Postulate: The distance between 2 points is the absolute value of the difference of the two coordinates.

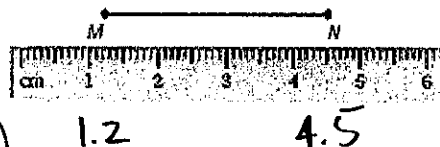
$$x_2 \neq x^2$$



$$AB = |x_2 - x_1|$$

Example: 1. Measure the length of $\overline{MN}$ to the nearest tenth of a centimeter.

$$\begin{aligned} MN &= |1.2 - 4.5| \\ &= |-3.3| \\ &= 3.3 \end{aligned}$$



Congruent Segments

Line segments that have the same length are called congruent segments ($\cong$)

same # tick marks show $\cong$



LENGTHS are Equal

$$AB = CD$$

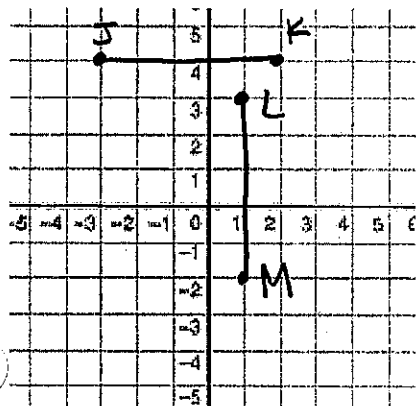
$$\overline{AB} = \overline{CD}$$

SEGMENTS are Congruent

$$\overline{AB} \cong \overline{CD}$$

$$\overline{AB} \cong \overline{CD}$$

Example: 2. Plot J(-3, 4), K(2, 4), L(1, 3) and M(1, -2) in the coordinate plane below. Then determine whether $\overline{JK}$ and $\overline{LM}$ are congruent.



$$\begin{aligned} JK &= |-3 - 2| \\ &= |-5| \\ &= 5 \end{aligned}$$

$$\begin{aligned} LM &= |3 - (-2)| \\ &= |5| \\ &= 5 \end{aligned}$$

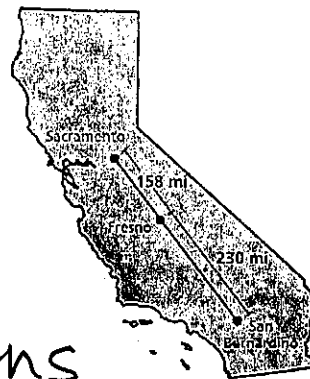
Since $JK = LM$, then $\overline{JK} \cong \overline{LM}$

Using the Segment Addition Postulate

Think About It... How far is Sacramento from San Bernadino?
Briefly explain how your group found the answer.

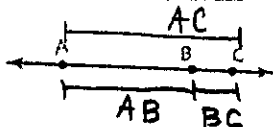
388 miles

add 2 segment lengths



**When three points are collinear, we can say that one point is between the other two.

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



Examples:

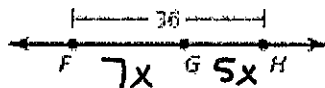
3. Find DF. (*remember, no bar on top of DF means find its length)



$$DF = 23 + 35$$

$$DF = 58$$

4. Find GH.



$$FG + GH = FH$$

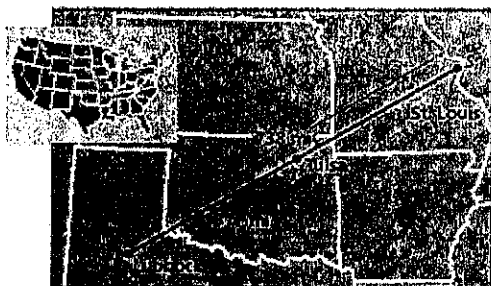
$$7x + 5x = 36$$

$$12x = 36$$

$$x = 3$$

$$GH = 15$$

5. How far is Tulsa from St. Louis?

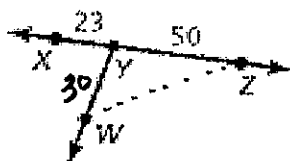


361 miles

$$(377 + x = 738)$$

$$738 - 377 =$$

Think About It... In the diagram, $WY = 30$. Can you use the Segment Addition Postulate with the other given lengths to find the distance between points W and Z? Briefly explain why this is or is not possible.



No because there is no point between W and Z