Need Ruler, Graph Paper

1.2 Use Segments and Congruence

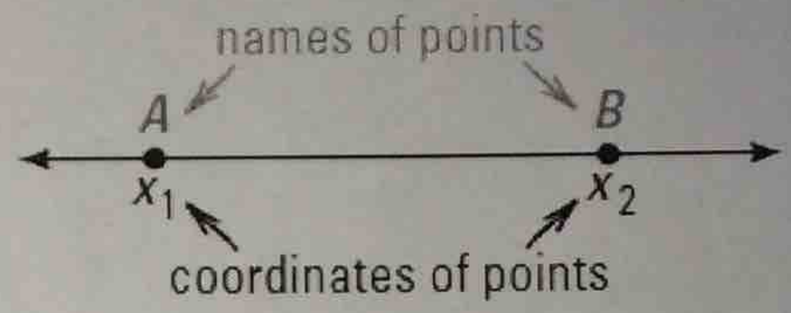
postulate – a rule that is accepted without proof, also called an *axiom*

theorem – a true statement that follows as a result of other true statements

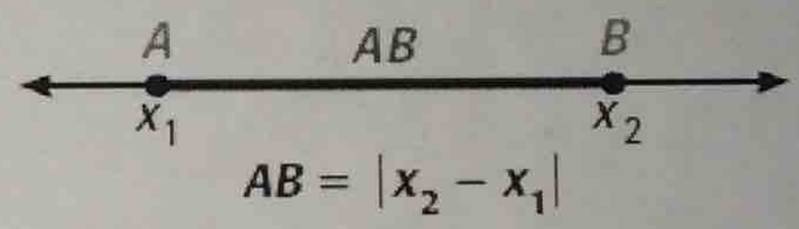
POSTULATE — For Your Notebook

POSTULATE 1 Ruler Postulate

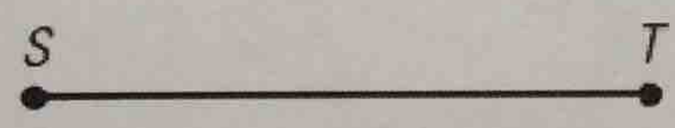
The points on a line can be matched one to one with the real numbers. The real number that corresponds to a point is the **coordinate** of the point.



The **distance** between points A and B, written as AB, is the absolute value of the difference of the coordinates of A and B.



Ex 1: Draw a line segment and measure it to the nearest tenth of a centimeter in **TWO** different ways.

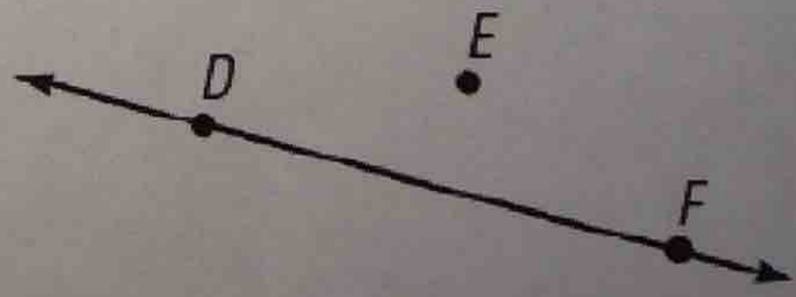


ST = |5-0| = 5 cm

ST = |6-1| = 5 cm

between - when 3 points are collinear, one point is between the other two (does not have to be in the middle)

Point *B* is between points *A* and *C*.



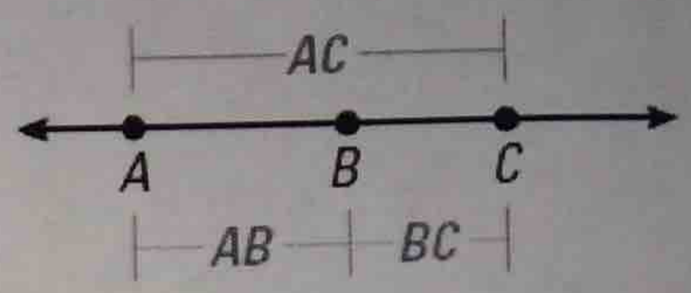
Point *E* is not between points *D* and *F*.

POSTULATE — For Your Notebook

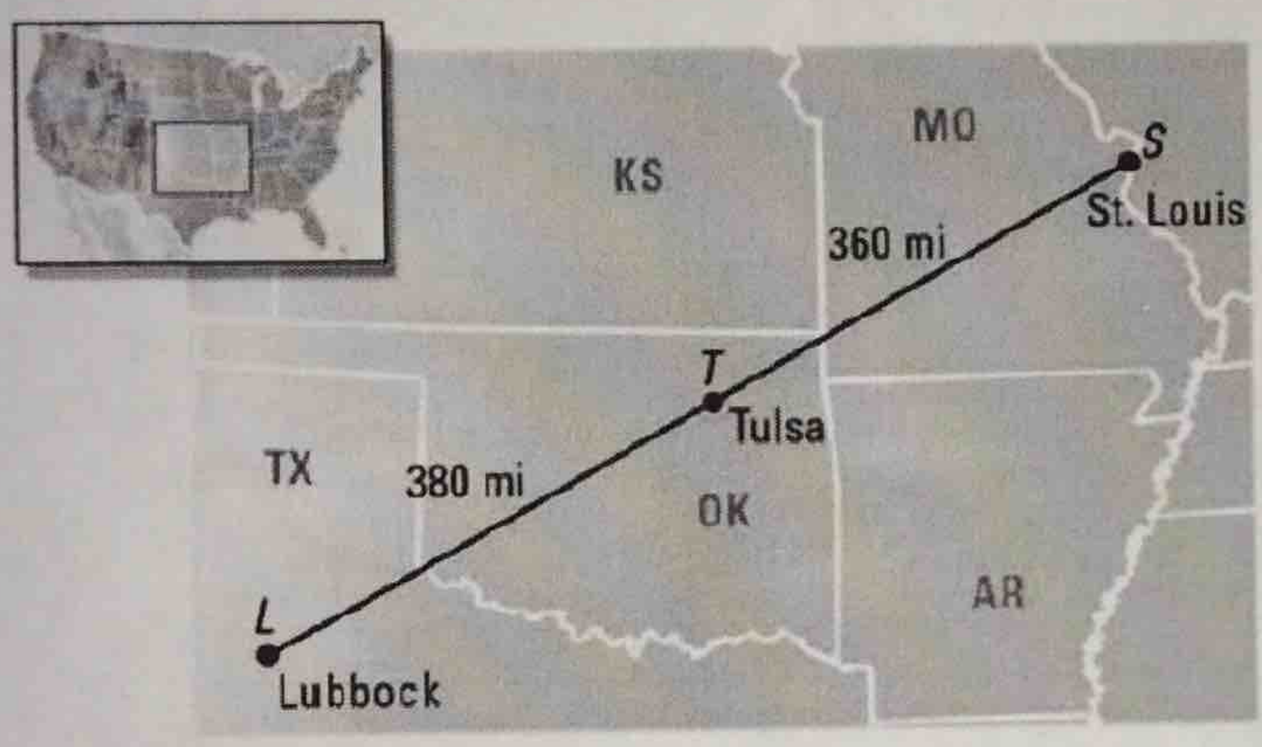
POSTULATE 2 Segment Addition Postulate

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

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



Ex 2: The cities shown lie approximately in a straight line. Find the distance between Lubbock and St. Louis.

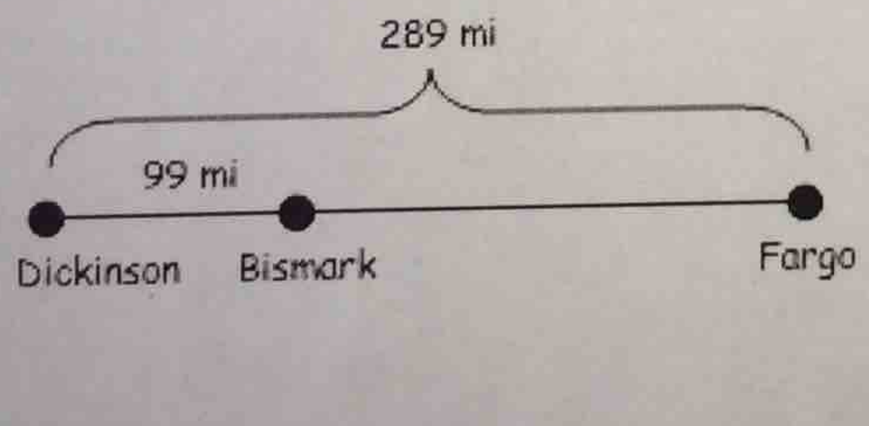


$LS = LT + TS$

$= 380 + 360$

$= \boxed{740 \text{ mi}}$

Ex 3: The cities shown lie approximately in a straight line. Find the distance from Bismark to Fargo.



$DF = DB + BF$

$289 = 99 + BF$

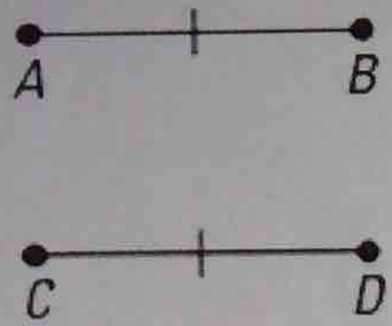
$-99 \quad -99$

$BF = \boxed{190 \text{ mi}}$

KEY QUESTION: Could you have found the distance if the points were not in a straight line? Explain.

No, because then the Segment Addition Postulate no longer applies.

congruent segments - line segments that have the same length



Lengths are equal.

$AB = CD$

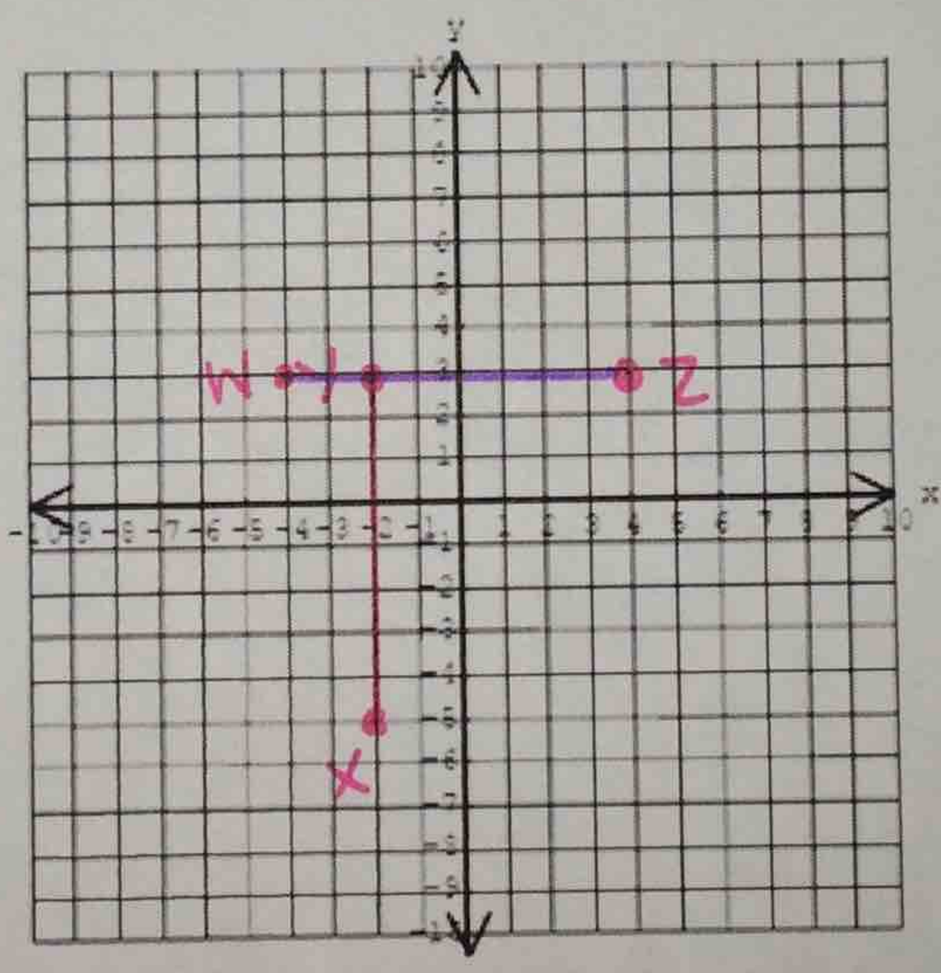
"is equal to"

Segments are congruent.

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

"is congruent to"

Ex 4: Graph the points X(-2, -5), Y(-2, 3), W(-4, 3), and Z(4, 3) in a coordinate plane. Are $\overline{XY}$ and $\overline{WZ}$ congruent? Find each length in **THREE** different ways.



WZ = 8 boxes
= 8 units

$WZ = |4-(-4)| = 8$

$WZ = |-4-4| = 8$

YX = 8 boxes
= 8 units

$YX = |-5-3| = 8$

$YX = |3-(-5)| = 8$

Yes $\overline{XY}$ and $\overline{WZ}$ are congruent.
They are both 8 units in length.