Teacher Notes:

Big Ideas: Using the ruler postulate to find distance

Definition of Postulate/Axiom/Theorem

Congruent Segments

Segment Addition Postulate

**I don't like the book assignment -- WAY too easy. The assignment for this lesson is a WS.

1.2 Measuring and Constructing Segments

Simplify.

1. $\left(\frac{2}{9}\right)\left(\frac{3}{2}\right)$

$$\frac{4}{18} + \frac{27}{18} = \boxed{\frac{31}{18}}$$

2. $4 - 2\frac{1}{4}\left(\frac{4}{1}\right) - \frac{9}{4}$

$$\frac{16}{4} - \frac{9}{4} = \boxed{\frac{7}{4}}$$

3. $\frac{2}{5} \div \frac{1}{10}$ $\frac{2}{5} \cdot \frac{10}{1}$

$$\boxed{4}$$

4. $\frac{3}{9} \times \frac{3}{4}$

$$\frac{3}{12} = \boxed{\frac{1}{4}}$$

5. $\frac{2}{5} \times \frac{10}{5}$

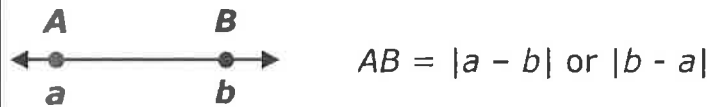$$\boxed{\frac{4}{5}}$$

6. $\frac{4}{10} \div \frac{2}{38}$
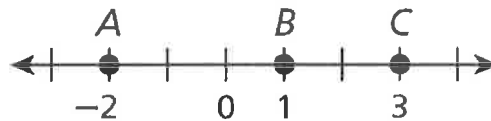
$$\frac{4}{10} \cdot \frac{38}{2}$$

$$\boxed{\frac{38}{5}}$$

Ruler Postulate

The **distance** (or **length**) between any two points is the absolute value of the difference of the coordinates.

A   B

$AB = |a - b|$ or $|b - a|$

a   b

Find each length.

A   B   C

−2   0 1   3

A. BC **B.** AC

Congruent Segments - line segments with the same length

can say "the length of AB is equal to the length of CD," or you can say "AB is congruent to CD." The symbol $\cong$ means "is congruent to."

A   B

C   D

Lengths are equal.
$AB = CD$

⬆
"is equal to"

Segments are congruent.
$\overline{AB} \cong \overline{CD}$

⬆
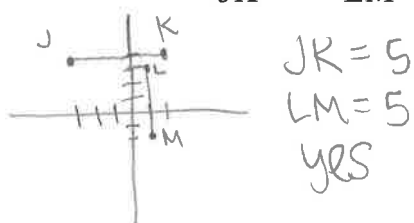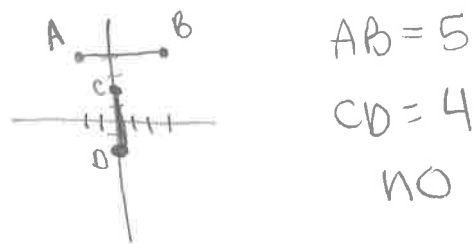"is congruent to"

**Tick marks are used to show congruent segments

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

JK = 5
LM = 5
yes

Plot $A(-2, 4)$, $B(3, 4)$, $C(0, 2)$, and $D(0, -2)$ in a coordinate plane. Then determine whether $\overline{AB}$ and $\overline{CD}$ are congruent.

AB = 5
CD = 4
no

When three points are collinear, you can say that one point is between the other two.
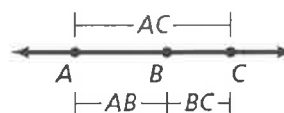
Point B is between points A and C.

Point E is not between points D and F.
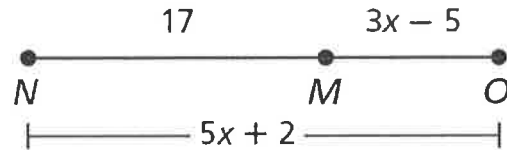
Postulate

Postulate 1.2   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.

M is between N and O.

Find NO.

17      $3x - 5$

N   M   O

$5x + 2$

$NM + MO = NO$

$17 + 3x - 5 = 5x + 2$

$12 + 3x = 5x + 2$

$ -3x -3x$

$\overline{ 12 = 2x + 2}$

$12 = 2x + 2$

$-2 -2$

$\overline{}$

$\dfrac{10}{2} = \dfrac{2x}{2}$

$x = 5$

$5(5) + 2$

$\boxed{NO = 27}$

E is between D and F. Find DF.

D $3x - 1$ E   13   F

$6x$

$DE + EF = DF$

$3x - 1 + 13 = 6x$

$3x + 12 = 6x$

$-3x -3x$

$\overline{}$
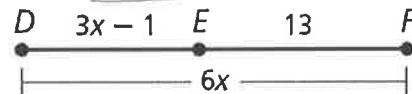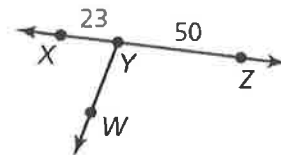
$\dfrac{12}{3} = \dfrac{3x}{3}$

$x = 4$

$DF = 6(4)$

$\boxed{DF = 24}$

Use the diagram at the right.

In the diagram, $WY = 30$. Can you use the Segment Addition Postulate to find the distance between points W and Z? Explain your reasoning.

23   50

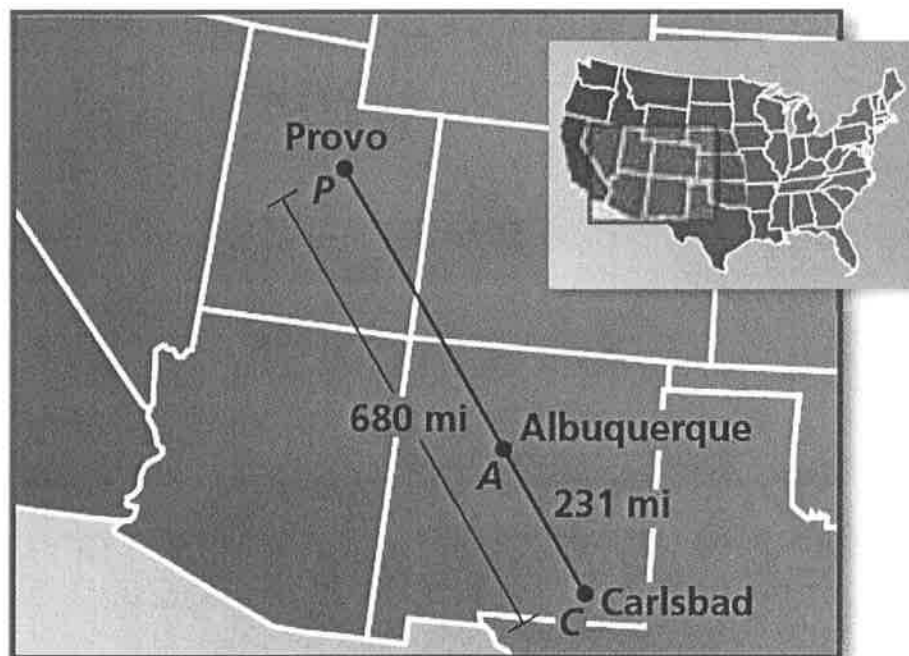X   Y   Z

W

no — all points need to be on the same line to use seg. addition

The cities shown on the map lie approximately in a straight line. Find the distance from Tulsa, Oklahoma, to St. Louis, Missouri.

738 mi

St. Louis

Tulsa

377 mi

L Lubbock
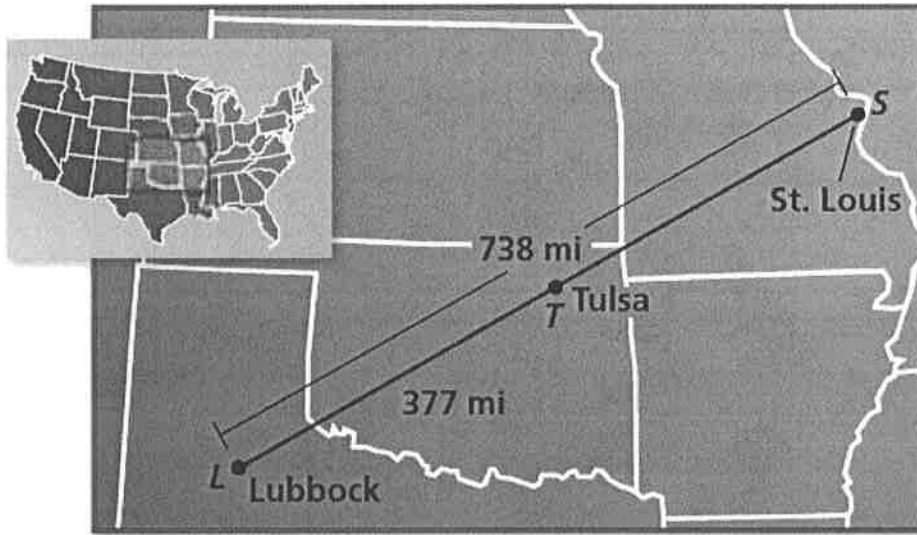
$LT + TS = LS$

$377 + X = 738$

$-377 \qquad -377$

$X = 361 \text{ miles}$

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9. The cities shown on the map lie approximately in a straight line. Find the distance from Albuquerque, New Mexico, to Provo, Utah.

Provo

P

$PA + AC = PC$

$X + 231 = 680$

$-231 \quad -231$

$X = 449$ miles

680 mi \ Albuquerque

A

231 mi

C Carlsbad