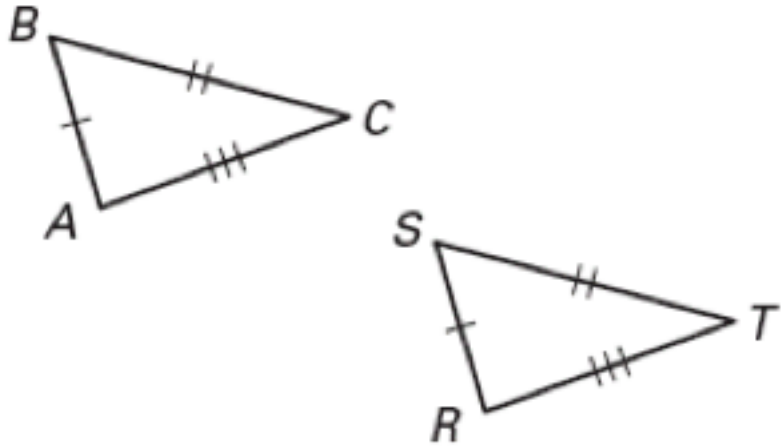
4.8 Prove Triangles Congruent by SSS

pp. 253 – 255

VOCABULARY

Congruent figures Two geometric figures that have exactly the same shape and size.

Corresponding parts A pair of sides or angles that have the same relative position in two congruent or similar figures.



Coordinate proof A proof that involves placing geometric figures in a coordinate plane.

SIDE-SIDE-SIDE (SSS) CONGRUENCE POSTULATE

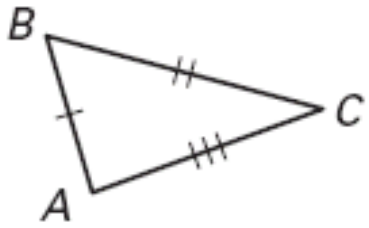
If three sides of one triangle are congruent to three sides of a second triangle, then the two triangles are congruent.

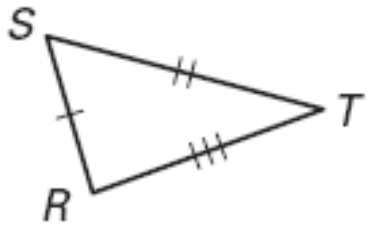
If Side $\overline{AB} \cong$ _____,

Side $\overline{BC} \cong$ _____, and

Side $\overline{CA} \cong$ _____,

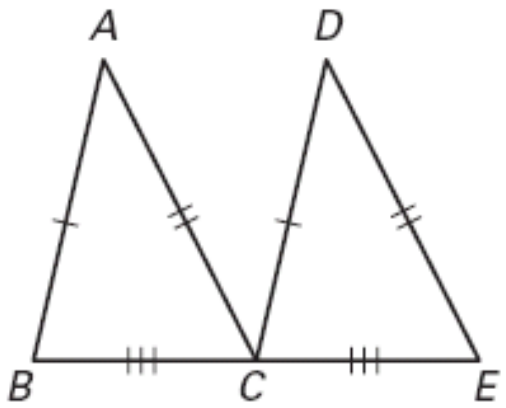
then $\triangle ABC \cong$ _____.





Example 1 *Use the SSS Congruence Postulate*

Show that $\triangle ABC \cong \triangle DCE$.



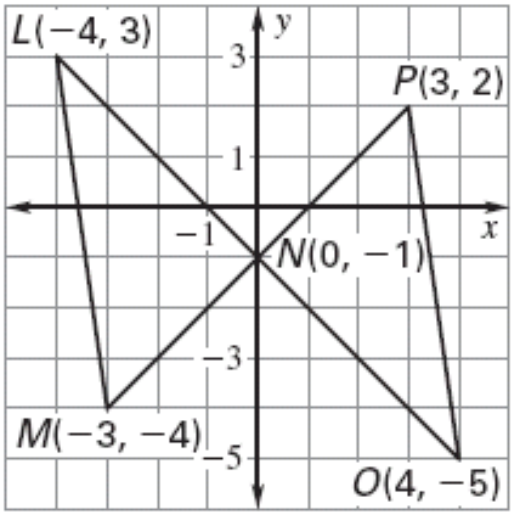
Solution

It is given that $\overline{AB} \cong \overline{DC}$, $\overline{BC} \cong \overline{CE}$, and _____. So, by the _____,

$\triangle ABC \cong$ _____.

Example 2 *Congruent triangles in a coordinate plane*

Use the SSS Congruence Postulate to show that $\triangle LMN \cong \triangle OPN$.



Solution

Use the Distance Formula to show that corresponding sides are the same length.

$$LM = \sqrt{(-3-(-4))^2 + (-4-3)^2}$$

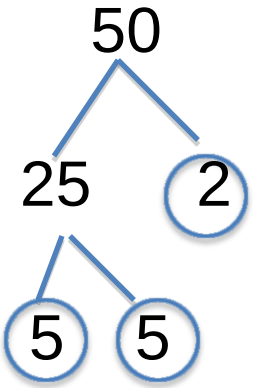
$$= \sqrt{\_\_\_\_^2 + \_\_\_\_^2} \quad = \sqrt{1+49} \quad = \sqrt{50}$$

$$= \_\_\_\_$$

$$OP = \sqrt{(3-4)^2 + (2-(-5))^2}$$

$$= \sqrt{\_\_\_\_^2 + \_\_\_\_^2} \quad = \sqrt{1+49} \quad = \sqrt{50}$$

$$= \_\_\_\_$$



So, $LM = OP$, and hence $\_\_\_\_ \cong \_\_\_\_$.

$$MN = \sqrt{(0 - (-3))^2 + ((-1) - (-4))^2}$$

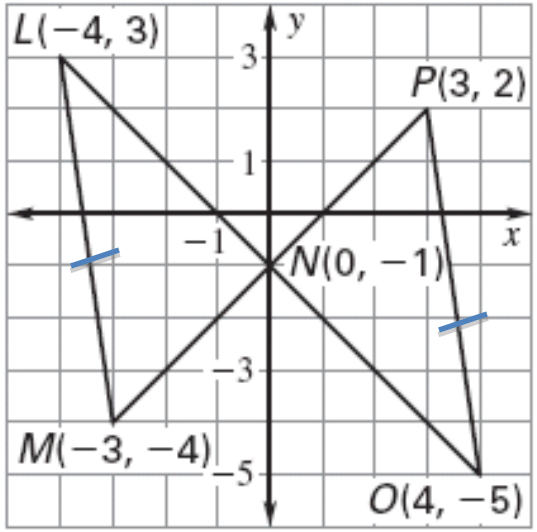
$$= \sqrt{\_\_\_\_^2 + \_\_\_\_^2}$$

$$= \_\_\_\_$$

$$PN = \sqrt{(0 - 3)^2 + (-1 - 2)^2}$$

$$= \sqrt{\_\_\_\_^2 + \_\_\_\_^2}$$

$$= \_\_\_\_$$



So, $MN = PN$, and hence _____ $\cong$ _____.

$NL = \sqrt{(-4 - 0)^2 + (3 - (-1))^2}$

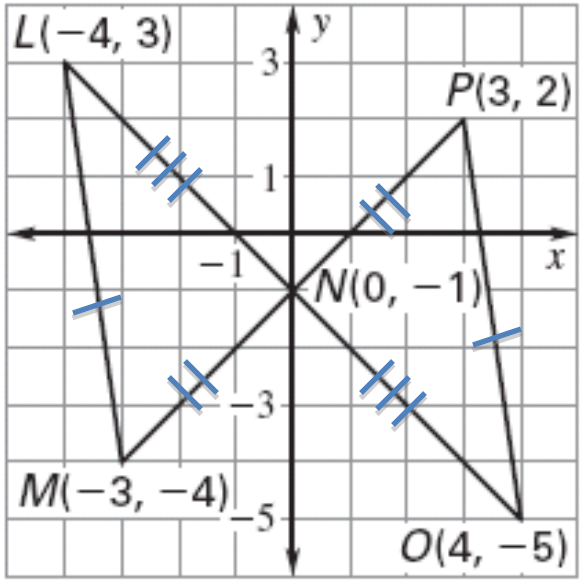
$= \sqrt{\_\_\_\_^2 + \_\_^2}$

$= \_\_\_\_\_$

$NO = \sqrt{(4 - 0)^2 + (-5 - (-1))^2}$

$= \sqrt{\_\_\_\_^2 + \_\_\_\_^2}$

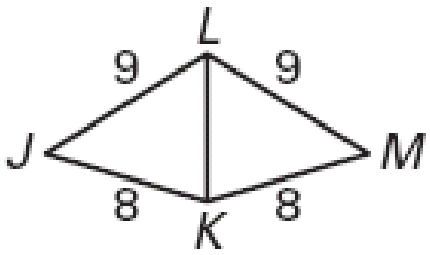
$= \_\_\_\_\_$



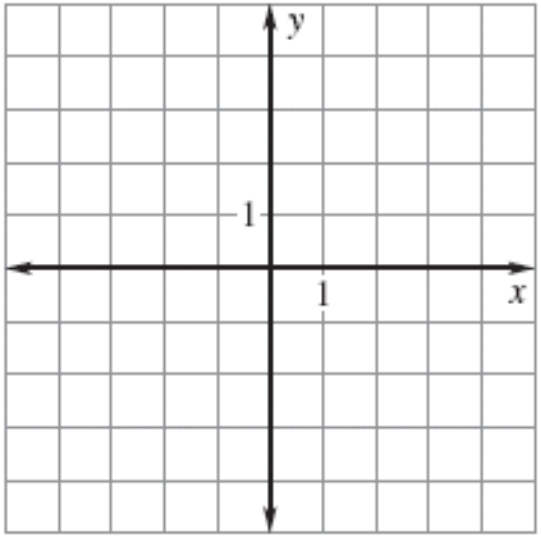
So, $NL = NO$, and hence _____ $\cong$ _____.

So, by the _____, you know that $\triangle LMN \cong$ _____.

1. Decide whether $\triangle JKL \cong \triangle MKL$ is true. *Explain* your reasoning.



2. $\triangle DFG$ has vertices $D(-2, 4)$, $F(4, 4)$, and $G(-2, 2)$. $\triangle LMN$ has vertices $L(-3, -3)$, $M(-3, 3)$, and $N(-1, -3)$. Graph the triangles in the same coordinate plane and show that they are congruent.



HOMEWORK:

Textbook:

pp. 238-239 # 2-6 even, 10-16 all

pp. 240 # 2