**Activity 2.4.3 The SSS Congruence Theorem**

**Experiment**

Use sticks or straws of different lengths to create a triangle. Or you may use paper strips with holes and fasteners.) Have your partner use sticks or straws of the same lengths you used to create another triangle. Compare the two triangles you have created.

Based on your observation, write a conjecture. Fill in the blanks:

1. If three sides of one triangle are congruent to three sides of another triangle, then \_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Proving the SSS Conjecture**

Given ∆*ABC* and ∆*DEF* with

 *AB* = *DE*

 *BC* = *EF* and

 *CA* = *FD*

Prove: ∆*ABC* $≅$ ∆*DEF*

2. Translate ∆*DEF* by the vector from *D* to \_\_\_

Rotate ∆*D’E’F’* about point *D* so that ray $\vec{DE’}$*’* coincides with ray $\rightharpoonaccent{AB}$.

3. Explain why *E’’* will coincide with *B*.

4. What kind of figure is quadrilateral *AF’‘E’‘C*?

Draw segment $\overbar{CF’‘}$

5. Explain why ∆*CBF’’* is an isosceles triangle.

6. Therefore m $∠$*F’‘CE’‘* = m $∠$*\_\_\_\_\_\_\_\_*



7. Explain why ∆*CAF’’* is an isosceles triangle.

8. Therefore m $∠$*F’‘CA* = m $∠$*\_\_\_\_\_\_\_\_*

9. m $∠$*ACE’’* = m $∠\\_\\_\\_\\_\\_\\_\\_\\_\\_$ + m $∠$*­­­­\_\_\_\_\_\_\_\_*

**10. m $∠$*AF’’E’’*= m $∠\\_\\_\\_\\_\\_\\_\\_\\_\\_$ + m $∠$*­­­­\_\_\_\_\_\_\_\_*

11. Explain why m $∠$*ACE’’* = m $∠$*AF’’E’’.*

12. Which theorem may now be used to prove that ∆*ABC* $≅$ ∆*D’’E’’F’’*?