**Activity 2.3.3b Proving the Isosceles Triangle Theorem**

**Fill in the blanks in this proof.**

Given ∆*ABC* with *AB* = *BC*

Prove *m*$∠$*ABC= m*$∠$*ACB*

*Step 1*. Draw any line DE in the plane of the triangle and reflect ∆ABC over DE.

*Step 2a*. In ∆*ABC* and ∆*A’C’B*’

 *AB* = *AC* Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 *AB* = *A’B*’ Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Therefore *AC = A’B’* Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Step 2b*. In ∆*ABC* and ∆*A’C’B*’

 *AC* = *AB* Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 *AC* = *A’C*’ Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Therefore *AB = A’C’* Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 *Step* 2c. *m*$∠$*BAC*= *m*$∠$*CAB’* Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Step 3.* From Steps 2a, 2b, and 2c, we can prove that ∆*ABC* and ∆*A’C’B’* are congruent, by the \_\_\_\_\_\_\_ Congruence Theorem.

*Step 4. m*$∠$*ABC* = *m*$∠$*A’C’B’* since corresponding parts of congruent triangles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*Step 5. m*$∠$*A’CB’* = *m*$∠$*ACB* since reflections preserve \_\_\_\_\_\_\_\_\_\_\_\_\_measure.

*Step 6. m*$∠$*ABC* = *m*$∠$*ACB* by the \_\_\_\_\_\_\_\_\_\_\_ property of equality.