

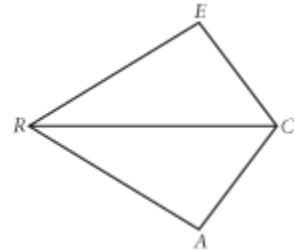
Lesson 4.7: Flowchart Thinking

In this lesson you will:

- write flowchart proofs

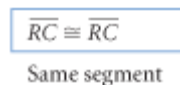
So far, you have been writing explanations as deductive arguments or paragraph proofs. First, we'll look at a diagram and explain why two angles must be congruent, by writing a paragraph proof in Example 1. Then we'll look at a different tool for writing proofs, and use that tool to write the same proof, in Example 2.

•Example 1: In the figure at right, $\overline{EC} \cong \overline{AC}$ and $\overline{ER} \cong \overline{AR}$. Is $\angle A \cong \angle E$? If so, give a logical argument to explain why they are congruent.

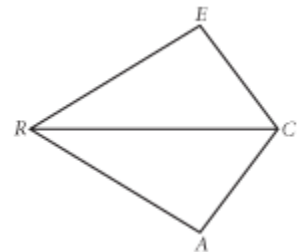
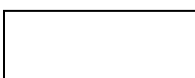
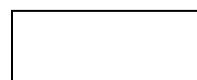
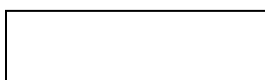
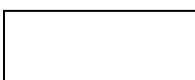
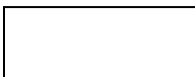


Sometimes a logical argument or a proof is long and complex, and a paragraph might not be the clearest way to present all the steps. A _____ is a visual way to organize all the steps in a complicated procedure in proper order. Arrows connect the boxes to show how facts lead to conclusions.

Flowcharts make your logic visible so that others can follow your reasoning. To present your reasoning in flowchart form, create a flowchart _____. Place each statement in a box. Write the logical _____ for each statement beneath its box. For example, you would write " $\overline{RC} \cong \overline{RC}$ because it is the same segment," as



•Example 2: Given: $\overline{EC} \cong \overline{AC}$ and $\overline{ER} \cong \overline{AR}$. Show $\angle A \cong \angle E$ using a flowchart proof.

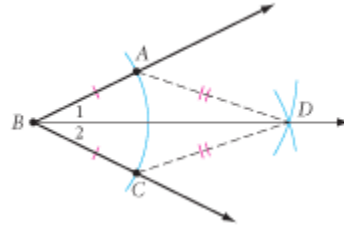


In a flowchart proof, the _____ show how the logical argument flows from the information that is given to the conclusion that you are trying to prove. Drawing an arrow is like says “_____.” You can draw flowcharts top to bottom or left to right.

•Example 3: In Chapter 3, you learned how to construct the bisector of an angle using a compass and straightedge. Now you have the skills to explain *why* the construction works, using deductive reasoning. Create a flowchart proof that explains why the construction method works.

Given: $\angle ABC$ with $\overline{BA} \cong \overline{BC}$ and $\overline{CD} \cong \overline{AD}$.

Show: \overline{BD} is the angle bisector of $\angle ABC$



⇒ASSIGNMENT: _____