NAME _____ DATE _____

Study Guide

Inductive Reasoning and Conjecturing

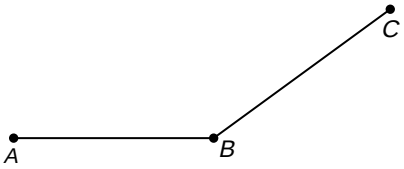
In daily life, you frequently look at several specific situations and reach a general conclusion based on these specific cases. For example, you might receive excellent service in a restaurant several times and conclude that the service is always good. Of course, you are not guaranteed that the service will be good when you return.

This type of reasoning, in which you look at several facts and then make an educated guess based on these facts, is called **inductive reasoning**. The educated guess is called a **conjecture**. Not all conjectures are true. When you find an example that shows the conjecture is false, this example is called a **counterexample**.

Example: Determine if the conjecture is *true* or *false* based on the given information. Explain your answer and give a counterexample if false.

Given: $\overline{AB} \cong \overline{BC}$
Conjecture: B is the midpoint of AC.

In the figure, $\overline{AB} \cong \overline{BC}$, but B is not the midpoint of $\overline{AC}$.
So the conjecture is false.



Determine if each conjecture is true or false based on the given information. Explain your answer and give a counterexample for any false conjecture.

1. **Given:** Collinear points D, E, and F.
   Conjecture: $DE + EF = DF$.

2. **Given:** $\angle A$ and $\angle B$ are supplementary.
   Conjecture: $\angle A$ and $\angle B$ are adjacent angles.

3. **Given:** $\angle D$ and $\angle F$ are supplementary.
   $\angle E$ and $\angle F$ are supplementary.
   Conjecture: $\angle D \cong \angle E$

4. **Given:** $\overline{AB}$ is perpendicular to $\overline{BC}$.
   Conjecture: $\angle ABC$ is a right angle.