Self-Test 1

Use the conditional: If $\overline{AB}$ and $\overline{CD}$ intersect, then $\overrightarrow{AB}$ and $\overrightarrow{CD}$ intersect.

1. Write the hypothesis and the conclusion of the conditional.
2. Write the converse of the conditional. Is the converse true or false?
3. Rewrite the following pair of conditionals as a biconditional:
   $\overline{AB} \cong \overline{CD}$ if $AB = CD$; $\overline{AB} \cong \overline{CD}$ only if $AB = CD$.
4. Provide a counterexample to disprove the statement:
   If $m\angle A$ is less than 100, then $\angle A$ is an acute angle.
5. Given: $m\angle A + m\angle B = 180$; $m\angle C = m\angle B$
   What property of equality justifies the statement $m\angle A + m\angle C = 180$?
6. Point M is the midpoint of $\overline{RT}$. $RM = x$ and $RT = 4x - 6$. Find the value of x.
7. The measure of $\angle ABC$ is 108. $\overrightarrow{BD}$ is the bisector of $\angle ABC$, and $\overrightarrow{BE}$ is the bisector of $\angle ABD$. Find the measure of $\angle EBC$.
8. You can use given information and theorems as reasons in proofs. Name two other kinds of reasons you can use.

Biographical Note

Julia Morgan

Julia Morgan (1872–1959), the first successful woman architect in the United States, was born in San Francisco. Though best known for her design of San Simeon, the castle-like former home of William Randolph Hearst pictured at the left, she designed numerous public buildings and private homes. Even today, to own "a Julia Morgan house" carries considerable prestige.

To become an architect, Morgan needed great determination as well as a brilliant mind. Since the University of California did not have an architecture curriculum at that time, she prepared for graduate work in Paris by studying civil engineering. In Paris the École des Beaux-Arts, which had just begun to admit foreigners, was particularly reluctant to admit a foreign woman. She persisted, however, and became the school's first woman graduate.