



Name _____

Date _____

Steps for writing an indirect proof (proof by contrapositive):

1. Assume temporarily that the conclusion (prove statement) is not true.
2. Reason logically to a conclusion (supported by a reason) that contradicts the given or a known fact.
3. Point out that the temporary assumption must be false, and the conclusion (prove statement) must be true.

Example 1: Given: $m\angle A + m\angle B \neq 180$
 Prove: $\angle A$ and $\angle B$ are not supplementary

Proof:

Assume temporarily that _____.

Then _____, because _____

_____. But this contradicts _____

_____.

The temporary assumption that _____

must be false, and it follows that _____.

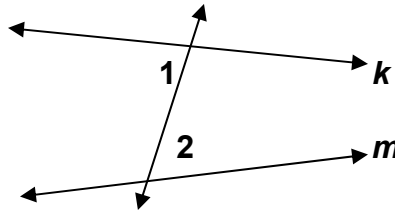
Example 2: Given: $\triangle CUP$ is acute
 Prove: $\angle C$ is not obtuse

Homework Problems

Copy given, prove, and figure (if any) and write an indirect proof.

1. Given: $k \parallel m$

Prove: $\angle 1 \not\cong \angle 2$

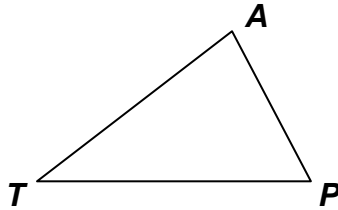


2. Given: $\angle 3 \not\cong \angle 4$

Prove: $\angle 3$ and $\angle 4$ are not vertical angles.

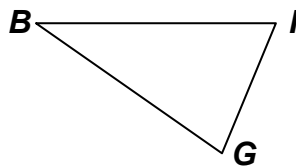
3. Given: scalene $\triangle TAP$

Prove: $\overline{TA} \not\cong \overline{PA}$



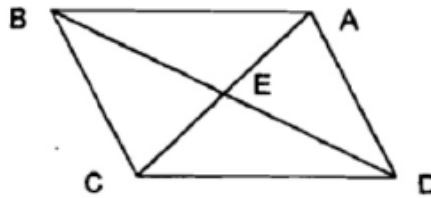
4. Given: $\triangle BIG$ with $\angle B \not\cong \angle G$

Prove: $\overline{BI} \not\cong \overline{GI}$



5. Given: $BE \neq DE$

Prove: $ABCD$ is not a parallelogram



6. Given: $\angle F \not\cong \angle R$

Prove: $\triangle FAM \not\cong \triangle RAM$

