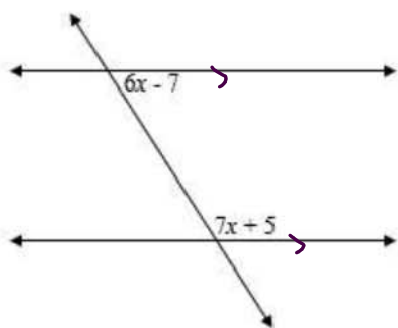


Geometry CC – Mr. Valentino  
Unit 7 Lesson 4: Indirect Proofs!

Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Period: \_\_\_\_\_

**Aim: What are indirect proofs (Day 1)?**

Do Now: If two parallel lines are cut by a transversal in the picture below, prove  $x \neq -12$



$$6x - 7 + 7x + 5 = 180$$

$$13x - 2 = 180$$

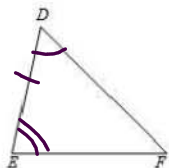
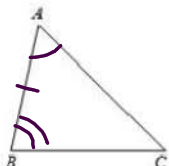
$$\frac{13x}{13} = \frac{182}{13}$$

$$x = 14 \leftarrow$$



1. Given:  $\angle A \cong \angle D$ ,  
 $\angle B \cong \angle E$ ,  
 $\angle C \not\cong \angle F$

Prove:  $\overline{AB} \neq \overline{DE}$



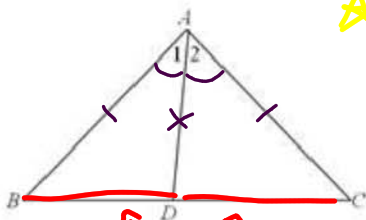
Statement	Reason
① $\angle A \cong \angle D$	① Given
② $\angle B \cong \angle E$	② Given
★ ③ $\angle C \not\cong \angle F$	③ Given
④ $\overline{AB} \cong \overline{DE}$	④ Assumption
⑤ $\triangle ABC \cong \triangle DEF$	⑤ ASA $\cong$ ASA
★ ⑥ $\angle C \cong \angle F$	⑥ CPCTC
⑦ $\overline{AB} \neq \overline{DE}$	⑦ Contradiction steps 3 and 6

- Steps:
- ✓ 1. Write Given separately
  - ✓ 2. ASSUME opposite of prove statement.
  3. Prove triangles are congruent using Step 2
  4. Using CPCTC, the given information that WAS given as not congruent, now is congruent.
  5. CONTRADICTION!

**Indirect Proof:**  
Assume what you need to **prove** to be FALSE, and then show that something contradictory (or absurd) will happen.

2. Given:  $\overline{AB} \cong \overline{AC}$ ,  
 $\overline{BD} \neq \overline{DC}$ .

Prove:  $\angle 1 \neq \angle 2$ .

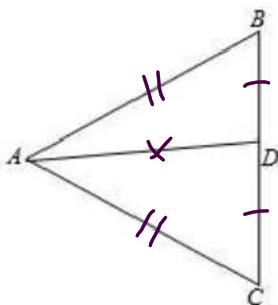


Corresponding parts assumed  $\cong$   $\Delta$ 's

Statement	Reason
① $\overline{AB} \cong \overline{AC}$	① Given
② $\overline{BD} \neq \overline{DC}$	② Given
③ $\angle 1 \cong \angle 2$	③ Assumption
④ $\overline{AD} \cong \overline{AD}$	④ Reflexive Property
⑤ $\triangle ABD \cong \triangle ACD$	⑤ SAS $\cong$ SAS
⑥ $\overline{BD} \cong \overline{DC}$	⑥ CPCTC
⑦ $\angle 1 \neq \angle 2$	⑦ Contradiction Steps 2 and 6

3. Given:  $\overline{BD} \cong \overline{DC}$   
 $\angle ADB \neq \angle ADC$

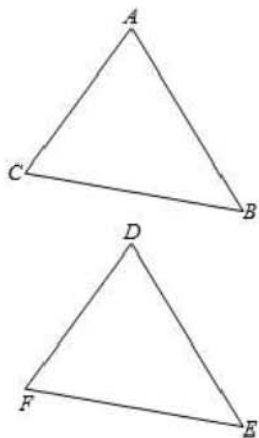
Prove:  $\overline{AC} \neq \overline{AB}$



Statement	Reason
① $\overline{BD} \cong \overline{DC}$	① Given
② $\angle ADB \neq \angle ADC$	② Given
③ $\overline{AC} \cong \overline{AB}$	③ Assumption
④ $\overline{AD} \cong \overline{AD}$	④ Reflexive Property

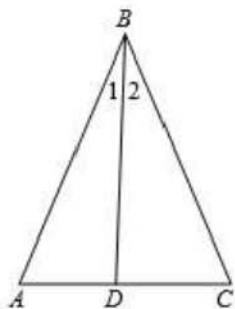
4. Given:  $\overline{AC} \cong \overline{DF}$ ,  
 $\angle C \cong \angle F$ ,  
 $\angle B \cong \angle E$

Prove:  $\overline{CB} \cong \overline{FE}$



5. Given:  $\overline{BA} \cong \overline{BC}$ ,  
 $\angle 1 \cong \angle 2$

Prove:  $\overline{AD} \cong \overline{DC}$



6. Given:  $\angle ADB \cong \angle CDB$ ,  
 $\overline{AB} \neq \overline{CB}$

Prove:  $\overline{DB}$  does not bisect  $\angle ABC$ .

