Created by Mr. Lischwe

Warmup 2/$\left(\sqrt{49} \cdot \sqrt[3]{27}\right)$

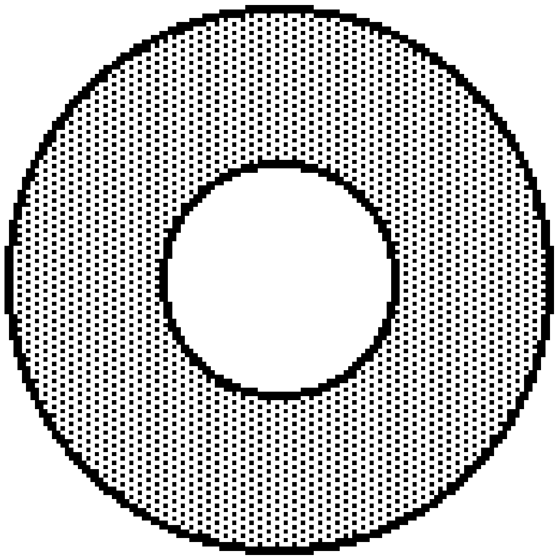
Hungry Horace has bought a large doughnut to share with his friends at a party.

The doughnut has a hole in it as shown.

Horace has invited eight people to his house, including Greedy Graham, Fat Freda and Tiny Tina.

Fortunately, none of Horace's friends mind how much they get, as long as they get something.

How can Horace cut the doughnut into nine pieces USING AS FEW STRAIGHT CUTS AS POSSIBLE?



QUIZ TUESDAY

ALL TRIANGLE CONGRUENCE SHORTCUTS AND PROOFS

THREE TYPES OF PROOFS:

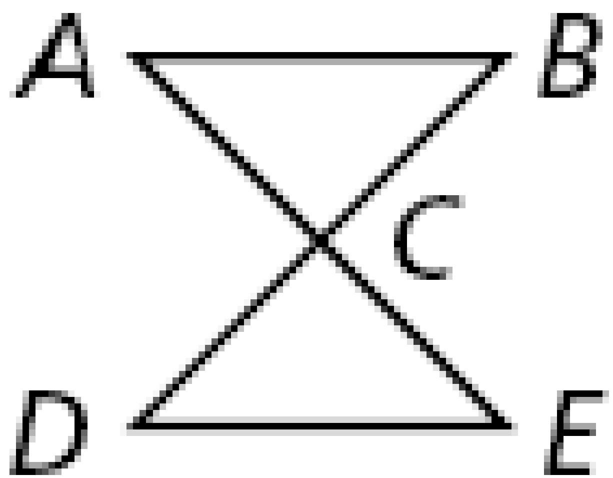
PARAGRAPH PROOFS
TWO-COLUMN PROOFS
FLOW-CHART PROOFS

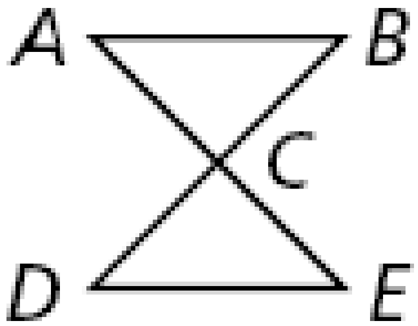
YOU MUST KNOW ALL THREE TYPES

Check Homework

Given: C is the midpoint of $\overline{BD}$ and $\overline{AE}$.

Prove: $\Delta ABC \cong \Delta EDC$

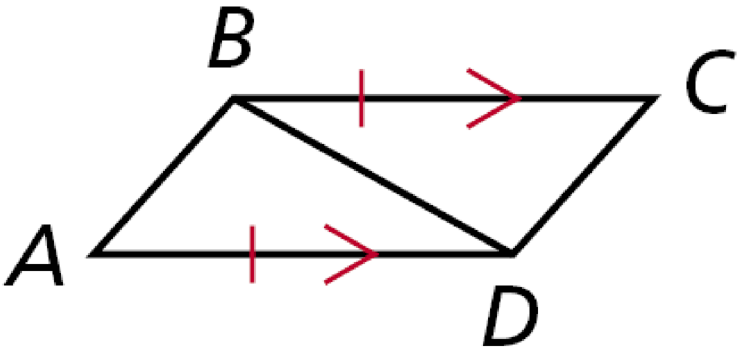




Statements	Reasons
1. C is mdpt. of BD and AE	1. Given
2. $\overline{AC} \cong \overline{EC}$	2. Def. of mdpt.
3. $\overline{BC} \cong \overline{DC}$	3. Def. of mdpt.
4. $\angle ACB \cong \angle ECD$	4. Vert. $\angle$s Thm.
5. $\Delta ABC \cong \Delta EDC$	5. SAS

Given: $\overline{BC} \parallel \overline{AD}$, $\overline{BC} \cong \overline{AD}$

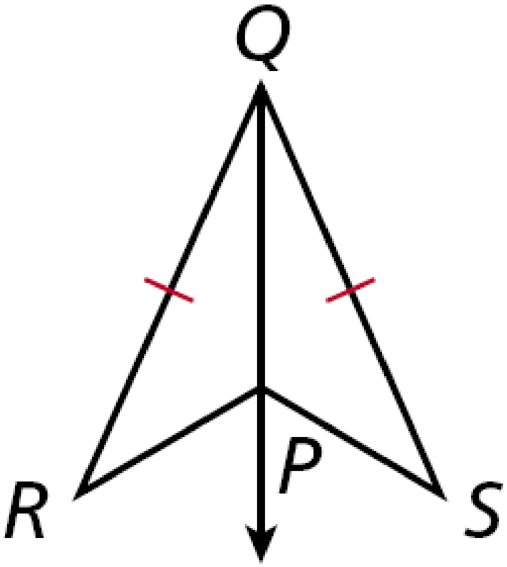
Prove: $\Delta ABD \cong \Delta CDB$



Statements	Reasons
1. $\overline{BC} \cong \overline{AD}$	1. Given
2. $\overline{BC} \parallel \overline{AD}$	2. Given
3. $\angle CBD \cong \angle ABD$	3. Alt. Int. $\angle$s Thm.
4. $\overline{BD} \cong \overline{BD}$	4. Reflex. Prop. of $\cong$
5. $\Delta ABD \cong \Delta\ CDB$	5. SAS

Given: $\overrightarrow{QP}$ bisects $\angle RQS$. $\overline{QR} \cong \overline{QS}$

Prove: $\Delta RQP \cong \Delta SQP$

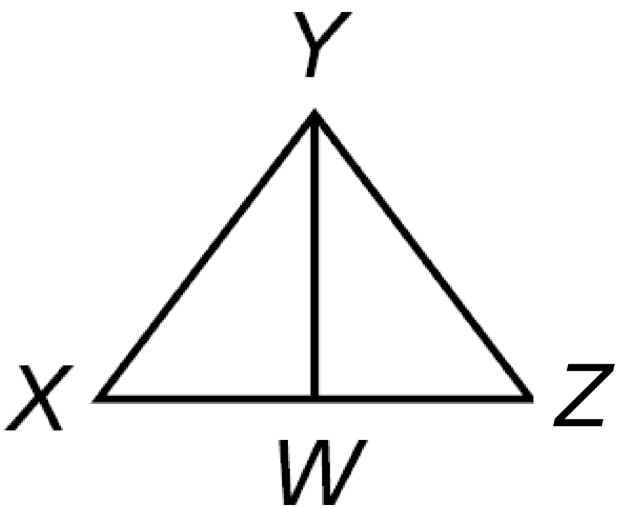


Statements	Reasons
1. $\overline{QR} \cong \overline{QS}$	1. Given
2. $\overrightarrow{QP}$ bisects $\angle RQS$	2. Given
3. $\angle RQP \cong \angle SQP$	3. Def. of angle bisector
4. $\overline{QP} \cong \overline{QP}$	4. Reflex. Prop. of $\cong$
5. $\Delta RQP \cong \Delta SQP$	5. SAS

Write a Flowchart Proof!

Given: $\overline{YW}$ bisects $\overline{XZ}$, $\overline{XY} \cong \overline{ZY}$.

Prove: $\angle XYW \cong \angle ZYW$



$\overline{YW}$ bisects $\overline{XZ}$.

Given

$\overline{XW} \cong \overline{ZW}$

Def. of bisector

$\overline{XY} \cong \overline{YZ}$

Given

$\overline{YW} \cong \overline{WY}$

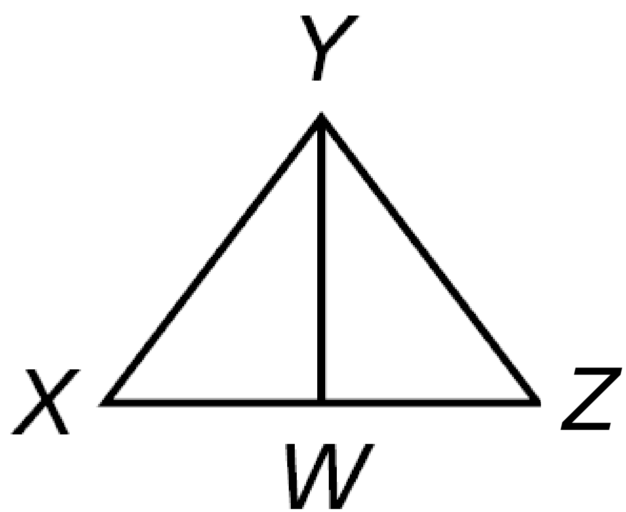
Reflex. Prop

$\triangle XYW \cong \triangle ZYW$

SSS

$\angle XYW \cong \angle ZYW$

CPCTC



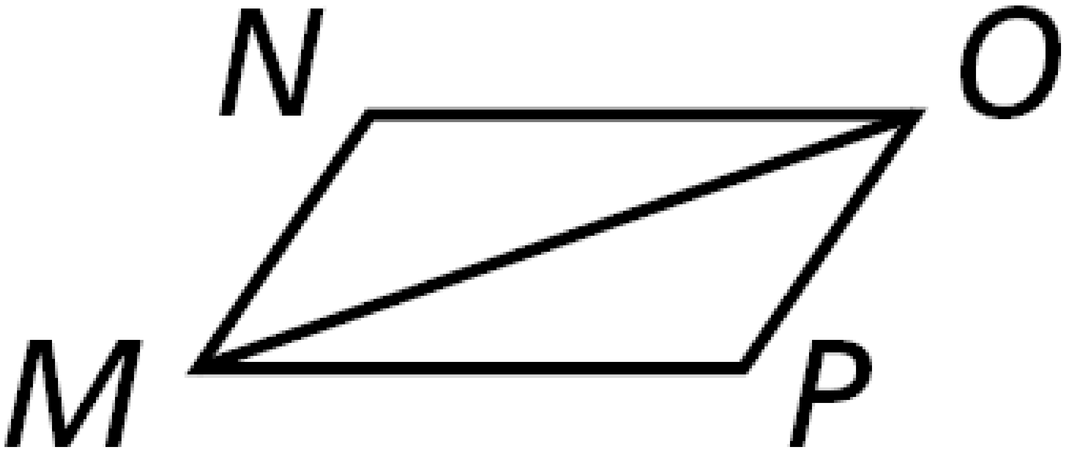
CPCTC is an abbreviation for the phrase "Corresponding Parts of Congruent Triangles are Congruent." It can be used as a justification in a proof after you have proven two triangles congruent.

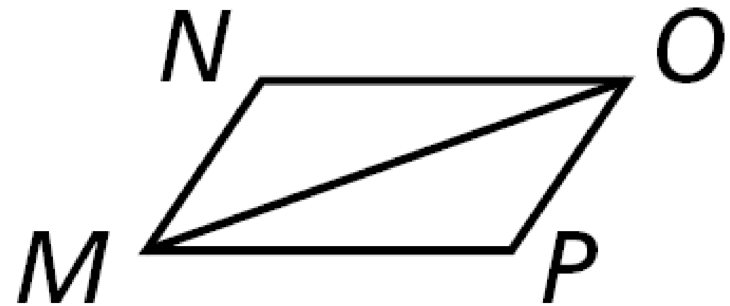
Remember!

SSS, SAS, ASA, AAS, and HL use corresponding parts to prove triangles congruent. CPCTC uses congruent triangles to prove corresponding parts congruent.

Write a Two Column Proof!

Given: $\overline{NO} \parallel \overline{MP}$, $\angle N \cong \angle P$
Prove: $\angle NMO \cong \angle POM$





Statements	Reasons
1. $\angle N \cong \angle P$	1. Given
2. $\overline{NO} \parallel \overline{MP}$	2. Given
3. $\angle NOM \cong \angle PMO$	3. Alt. Int. $\angle$s Thm.
4. $\overline{MO} \cong \overline{MO}$	4. Reflex. Prop. of $\cong$
5. $\Delta MNO \cong \Delta OPM$	5. AAS
6. $\angle NMO \cong \angle POM$	6. CPCTC

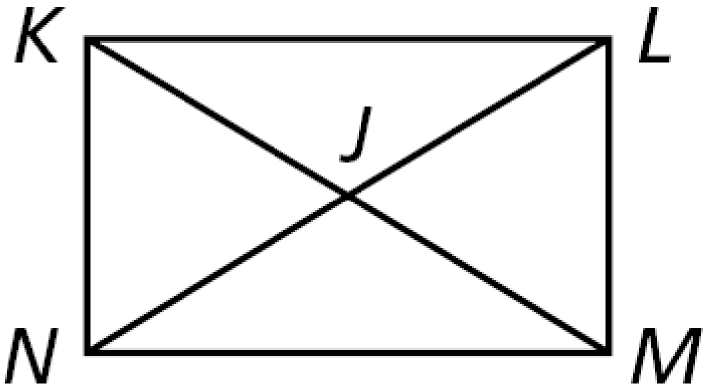
CPCTC

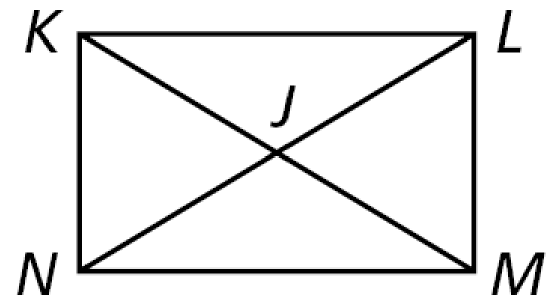
- Triangles have 6 “parts” (sides & angles)
- You need THREE of these to prove the triangles are congruent
  - (SSS, SAS, ASA, AAS, Right Angles + HL)
- Once you prove the triangles are congruent, the triangle becomes “unlocked” – the other three “parts” that you didn’t already know are congruent **are now automatically congruent**.

Write a **PARAGRAPH** Proof!!!

Given: J is the midpoint of $\overline{KM}$ and $\overline{NL}$.

Prove: $\angle LKJ \cong \angle NMJ$



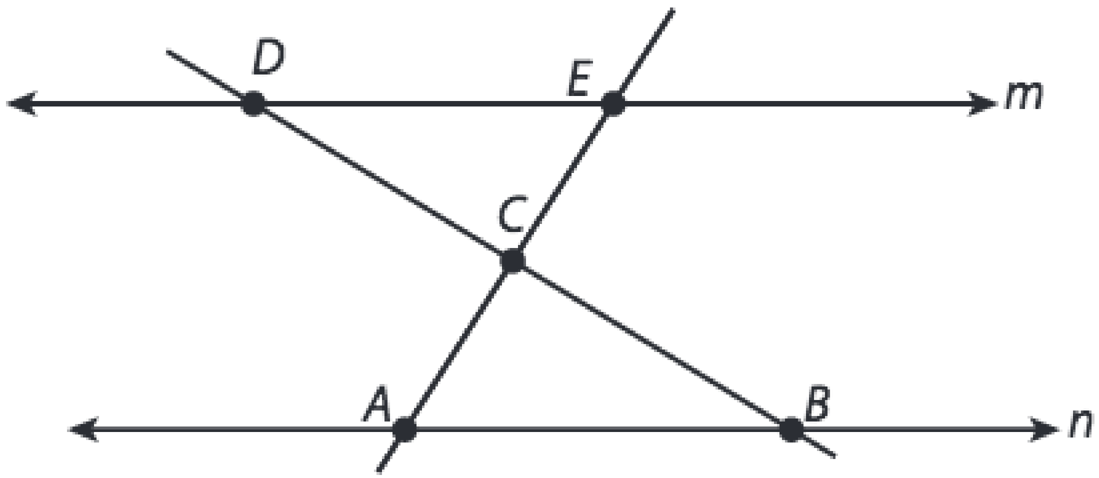


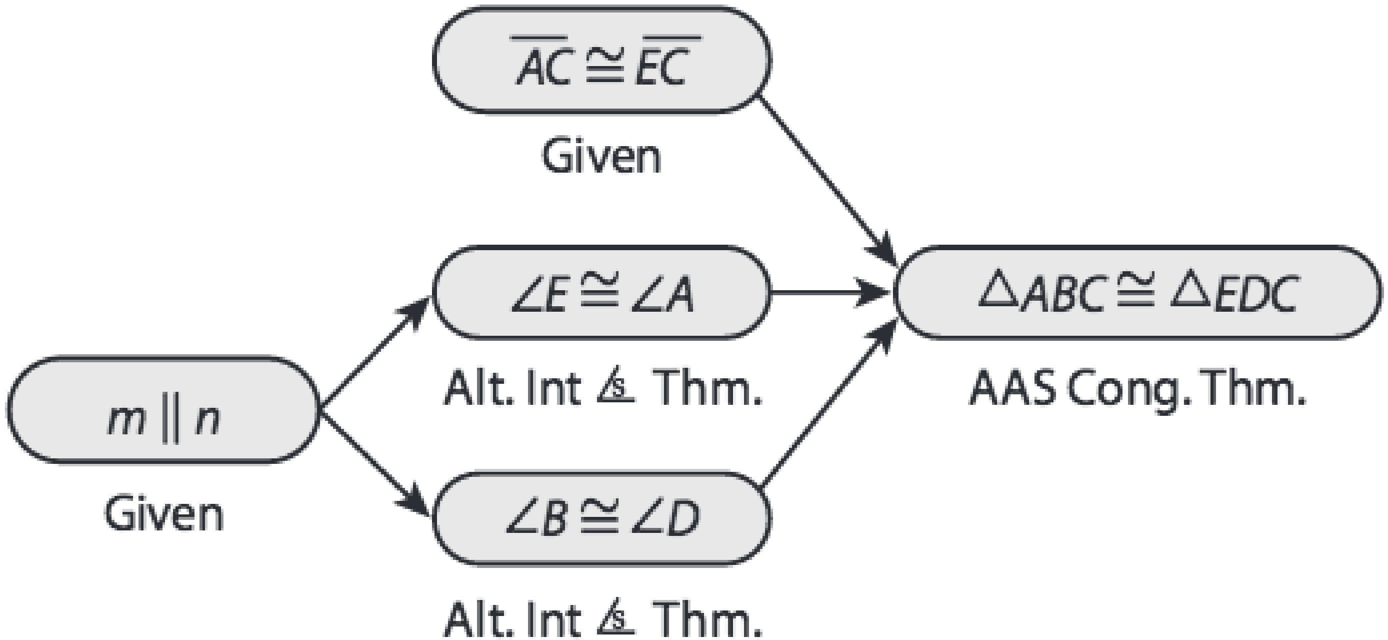
Statements	Reasons
1. J is the midpoint of $\overline{KM}$ and $\overline{NL}$.	1. Given
2. $\overline{KJ} \cong \overline{MJ}$, $\overline{NJ} \cong \overline{LJ}$	2. Def. of mdpt.
3. $\angle KJL \cong \angle MJN$	3. Vert. $\angle$s Thm.
4. $\Delta KJL \cong \Delta MJN$	4. SAS
5. $\angle LKJ \cong \angle NMJ$	5. CPCTC

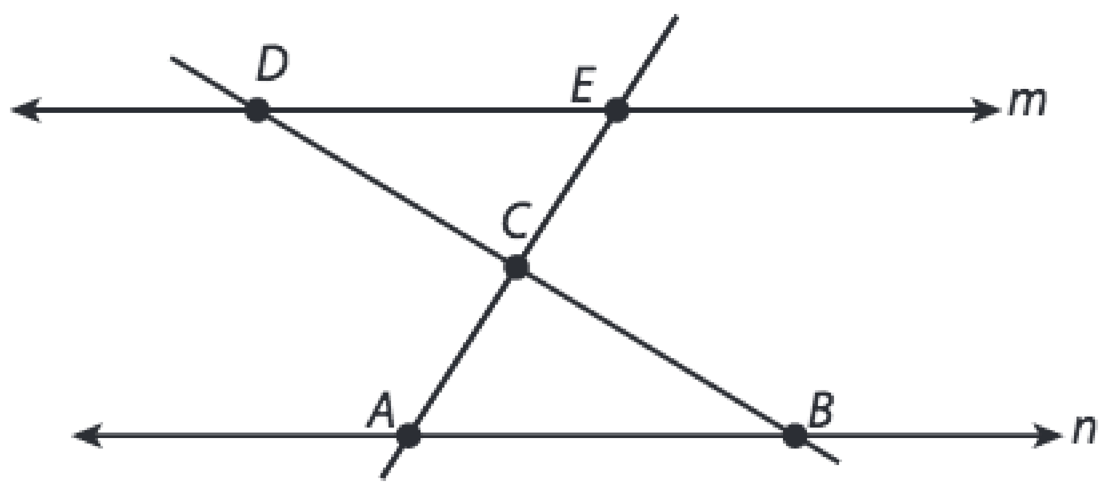
Write a flow chart Proof

Given: $\overline{AC} \cong \overline{EC}$ and $m \parallel n$

Prove: $\triangle ABC \cong \triangle EDC$



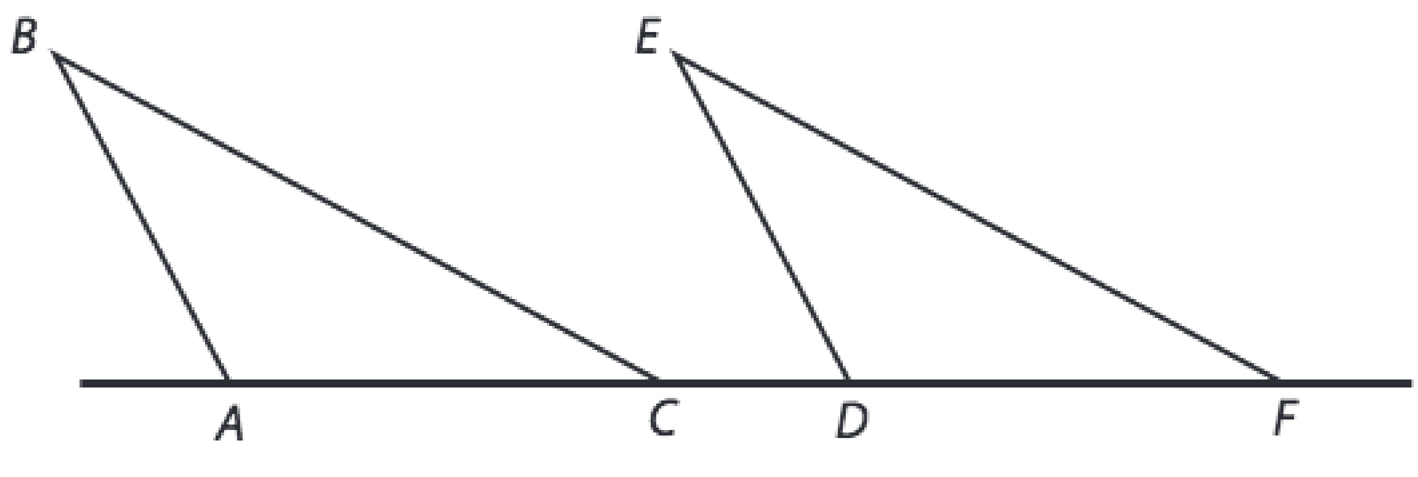

$\overline{AC} \cong \overline{EC}$
Given
$\angle E \cong \angle A$
Alt. Int ∠s Thm.
$m \parallel n$
Given
$\angle B \cong \angle D$
Alt. Int ∠s Thm.
$\triangle ABC \cong \triangle EDC$
AAS Cong. Thm.


D
E
m
C
A
B
n

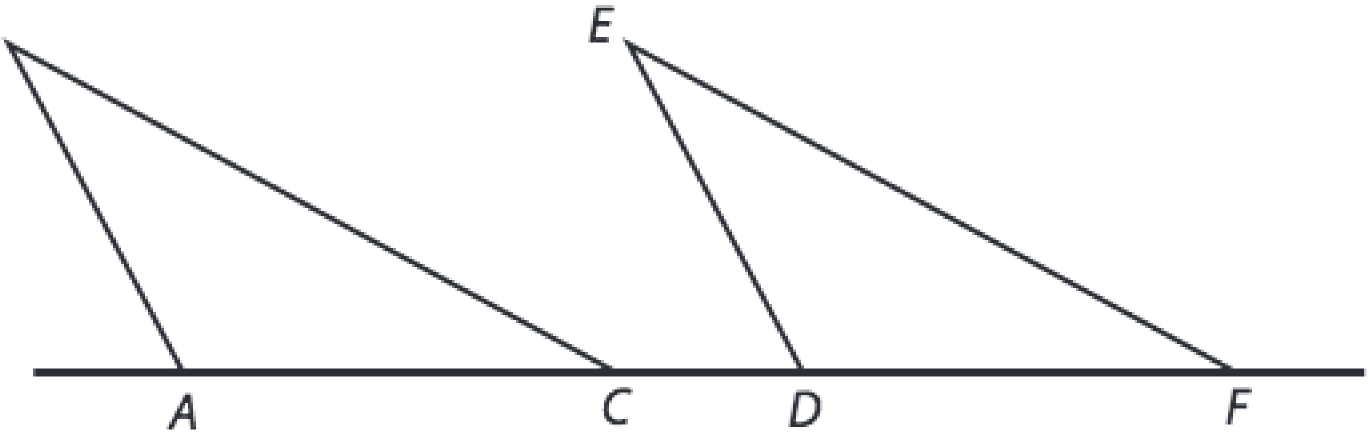
Write a Paragraph Proof

Given: $\angle ABC \cong \angle DEF$, $\overline{BC} \parallel \overline{EF}$, $\overline{AC} \cong \overline{DF}$.

Prove: triangle ABC is congruent to triangle DEF



Because $\overline{BC}$ is parallel to $\overline{EF}$, this means that $\angle ACB$ is congruent to $\angle DFE$, using the Corresponding Angles Theorem. Since $\angle ABC$ is congruent to $\angle DEF$ and $\overline{AC}$ is congruent to $\overline{DF}$, then one pair of corresponding angles and two pairs of non-included corresponding sides are congruent. This means that $\triangle ABC$ is congruent to $\triangle DEF$ using the AAS Triangle Congruence Theorem.



Homework

- Finish Worksheet