

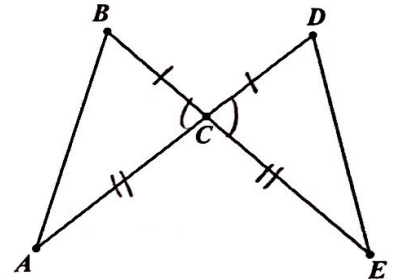
Geometry, Unit 4 - Congruent Triangles Proof Activity - Part I

Name Key

For each problem, do the following:

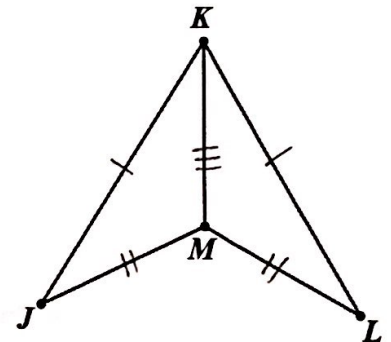
- Show the given information in the diagram (using tick marks to show congruent sides and arcs to show congruent angles)
- Show any other congruent parts you notice (from vertical angles, sides shared in common, or alternate interior angles with parallel lines)
- Give the postulate or theorem that proves the triangles congruent (SSS, SAS, ASA, AAS, HL)
- Finally, fill in the blanks to complete the proof.

1. Given: $\overline{BC} \cong \overline{DC}$; $\overline{AC} \cong \overline{EC}$
 Prove: $\triangle BCA \cong \triangle DCE$



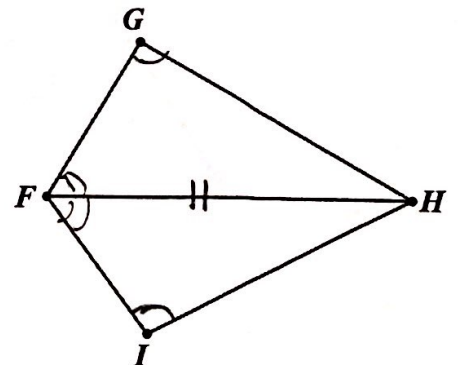
Statements	Reasons
1. $\overline{BC} \cong \overline{DC}$; $\overline{AC} \cong \overline{EC}$	1. Given
2. $\angle BCA \cong \angle DCE$	2. Vertical \angle s Theorem
3. $\triangle BCA \cong \triangle DCE$	3. SAS

2. Given: $\overline{JK} \cong \overline{LK}$; $\overline{JM} \cong \overline{LM}$
 Prove: $\triangle KJM \cong \triangle KLM$



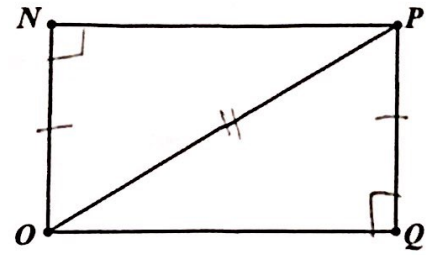
Statements	Reasons
1. $\overline{JK} \cong \overline{LK}$; $\overline{JM} \cong \overline{LM}$	1. Given
2. $\overline{KM} \cong \overline{KM}$	2. Reflexive Prop.
3. $\triangle KJM \cong \triangle KLM$	3. SSS

3. Given: $\angle G \cong \angle I$; \overline{FH} bisects $\angle GFI$
 Prove: $\triangle GFH \cong \triangle IFH$



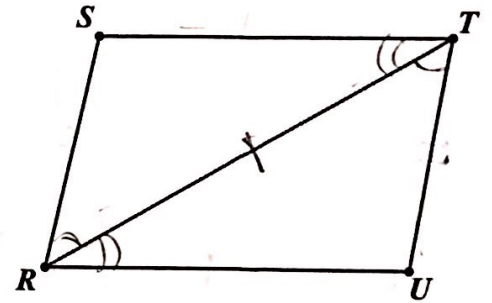
Statements	Reasons
1. $\angle G \cong \angle I$; \overline{FH} bisects $\angle GFI$	1. Given
2. $\angle GFH \cong \angle IFH$	2. Def. of <u>Bisect</u>
3. $\overline{FH} \cong \overline{FH}$	3. Reflexive Prop.
4. $\triangle GFH \cong \triangle IFH$	4. AAS

4. Given: $\angle N$ and $\angle Q$ are right angles; $\overline{NO} \cong \overline{PQ}$
 Prove: $\triangle ONP \cong \triangle PQO$



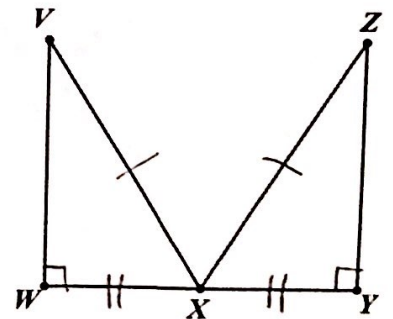
Statements	Reasons
1. $\angle N$ and $\angle Q$ are right angles	1. Given
2. $\triangle ONP$ and $\triangle PQO$ are <u>Right</u> triangles	2. Def. of right triangle
3. $\overline{OP} \cong \overline{OP}$	3. Reflexive Prop.
4. $\overline{NO} \cong \overline{PQ}$	4. Given
5. $\triangle ONP \cong \triangle PQO$	5. SSA

5. Given: $\overline{ST} \parallel \overline{RU}$; $\overline{SR} \parallel \overline{TU}$ *Parallel, not congruent*
 Prove: $\triangle SRT \cong \triangle UTR$



Statements	Reasons
1. $\overline{ST} \parallel \overline{RU}$	1. Given
2. $\angle STR \cong \angle URT$	2. If lines \parallel , alt. int. $\angle s \cong$
3. $\overline{SR} \parallel \overline{TU}$	3. Given
4. $\angle SRT \cong \angle UTR$	4. If lines \parallel , alt int $\angle s \cong$
5. $\overline{RT} \cong \overline{RT}$	5. Reflexive Prop
6. $\triangle SRT \cong \triangle UTR$	6. ASA

6. Given: $\angle W$ and $\angle Y$ are right angles; $\overline{VX} \cong \overline{ZX}$; X is the midpoint of \overline{WY}
 Prove: $\triangle VWX \cong \triangle ZYX$



Statements	Reasons
1. $\angle W$ and $\angle Y$ are right angles	1. Given
2. $\triangle VWX$ and $\triangle ZYX$ are right $\triangle s$	2. Def. of right triangle
3. $\overline{VX} \cong \overline{ZX}$; X is the midpoint of \overline{WY}	3. Given
4. $\overline{WX} \cong \overline{XY}$	4. Def. of midpoint
5. $\triangle VWX \cong \triangle ZYX$	5. HL

NO SSA!

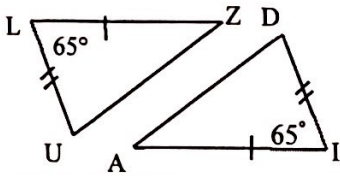
5. *Transversal. These questions are common!*

First Proofs

Name _____

Block _____ Date _____

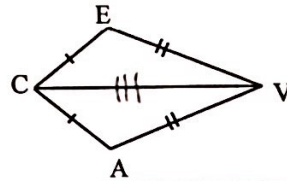
1.



Statement	Reason
$\overline{LZ} \cong \overline{AI}$	Given
$\angle L \cong \angle I$	Given
$\overline{LU} \cong \overline{DI}$	Given
$\triangle LUZ \cong \triangle AID$	SAS

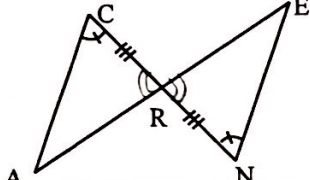
Triangles must be named specifically!

2.



Statement	Reason
$\overline{CE} \cong \overline{CA}$	Given
$\overline{EV} \cong \overline{VA}$	Given
$\overline{CV} \cong \overline{CV}$	Reflexive Prop
$\triangle CAV \cong \triangle CEV$	SSS

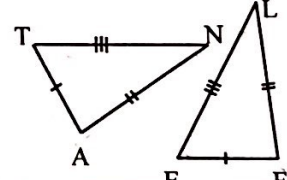
3. NOT ΔDAI or ΔAID or others, this is only way



Statement	Reason
$\angle C \cong \angle N$	Given
$\overline{CR} \cong \overline{RN}$	Given
$\angle CRA \cong \angle NRE$	Vertical Angles
$\triangle ARC \cong \triangle ERN$	ASA

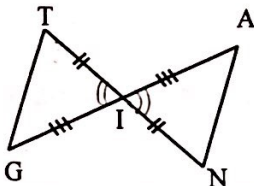
*Cannot have LR!

4.



Statement	Reason
$\overline{TA} \cong \overline{EF}$	Given
$\overline{TN} \cong \overline{EL}$	Given
$\overline{AN} \cong \overline{FL}$	Given
$\triangle ANT \cong \triangle FLE$	SSS

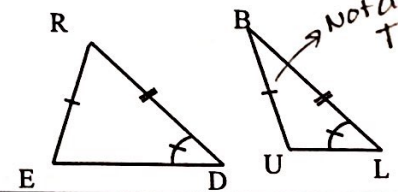
5.



Statement	Reason
$\overline{TI} \cong \overline{NI}$	Given
$\overline{GI} \cong \overline{AI}$	Given
$\angle TIG \cong \angle NIA$	Vertical Angles
$\triangle GIT \cong \triangle AIN$	SAS

Typo

6.

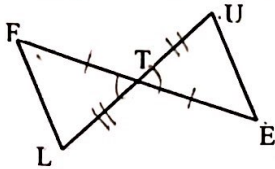


Statement	Reason
$\overline{ER} \cong \overline{UB}$	Given
$\overline{RD} \cong \overline{BL}$	Given
$\angle D \cong \angle L$	Given
$\triangle RED \cong \triangle ULB$	Cannot conclude

Not drawn to scale, Trust congruency symbol

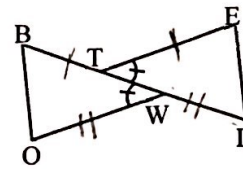
NO SSA

7. T is the midpoint of both \overline{FE} and \overline{LU} .



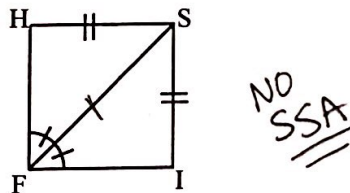
Statement	Reason
$\overline{FE} \cong \overline{ET}$	Definition of midpt
$\overline{LT} \cong \overline{TU}$	Definition of midpt
$\angle FTL \cong \angle EUT$	Vertical Angles
$\triangle FLT \cong \triangle EUT$	SAS

8. $\overline{BW} \cong \overline{ET}$ and $\overline{OW} \cong \overline{IT}$



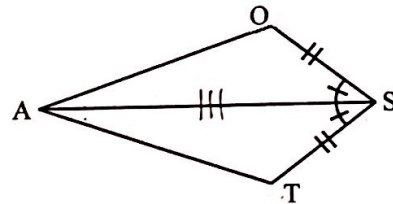
Statement	Reason
$\overline{BW} \cong \overline{ET}$	Given
$\overline{OW} \cong \overline{IT}$	Given
$\angle ETI \cong \angle BWO$	Given
$\triangle BOW \cong \triangle EIT$	SAS

9.



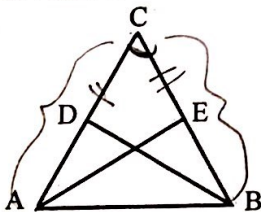
Statement	Reason
$\overline{HS} \cong \overline{SI}$	Given
$\angle HFS \cong \angle IFS$	Given
$\overline{SF} \cong \overline{SF}$	Reflexive Prop
$\triangle FSH \cong$	cannot conclude!

10.



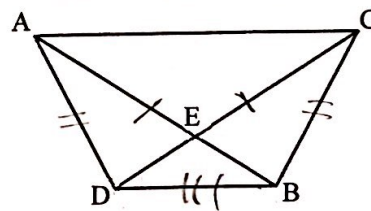
Statement	Reason
$\overline{OS} \cong \overline{ST}$	Given
$\angle OSA \cong \angle TSA$	Given
$\overline{AS} \cong \overline{AS}$	Reflexive Prop.
$\triangle SAT \cong \triangle SOA$	SAS

11. $\overline{AC} \cong \overline{BC}$ and $\overline{CE} \cong \overline{CD}$



Statement	Reason
$\overline{AC} \cong \overline{BC}$	Given
$\overline{CE} \cong \overline{CD}$	Given
$\angle ACE \cong \angle BCD$	Same Angle
$\triangle ACE \cong \triangle BCD$	SAS

12. $\overline{AB} \cong \overline{CD}$ and $\overline{AD} \cong \overline{BC}$



Statement	Reason
$\overline{AB} \cong \overline{CD}$	Given
$\overline{AD} \cong \overline{BC}$	Given
$\overline{DB} \cong \overline{DB}$	Reflexive Prop
$\triangle ABD \cong \triangle CPB$	SSS

vertical \angle s
dont make
here, not
w/in the
triangles!