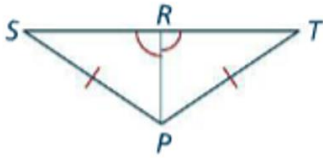


Section 3.7 Proofs

Given: $\overline{PS} \cong \overline{PT}$, $\angle PRS \cong \angle PRT$

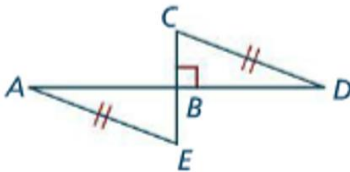
Prove: $\triangle PRS \cong \triangle PRT$



Statement	Reason
1. $\angle PRS \cong \angle PRT$	1. Given
2. $m\angle PRS = m\angle PRT$	2. Definition of congruent angles
3. $m\angle PRS + m\angle PRT = 180^\circ$	3. Two angles that form a linear pair are supplementary
4. $m\angle PRS + m\angle PRS = 180^\circ$ $m\angle PRT + m\angle PRT = 180^\circ$	4. Substitution
5. $m\angle PRS = 90^\circ$ $m\angle PRT = 90^\circ$	5. Division property
6. $\triangle SPR$ and $\triangle TPR$ are right triangles	6. Definition of right triangle
7. $\overline{PS} \cong \overline{PT}$	7. Given (HYPOTENUSE)
8. $\overline{PR} \cong \overline{PR}$	8. Reflexive Property of \cong (LEG)
9. $\triangle PRS \cong \triangle PRT$	9. HL \cong (steps 6,7,8)

Given: $\overline{CD} \cong \overline{EA}$, \overline{AD} is the perpendicular bisector of \overline{CE}

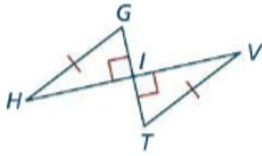
Prove: $\triangle CBD \cong \triangle EBA$



1. \overline{AD} is the \perp bisector of \overline{CE}	1. Given
2. $\angle CBD$ and $\angle EBA$ are right angles	2. Definition of perpendicular
3. $\triangle CBD$ and $\triangle EBA$ are right triangles	3. Definition of right triangles
4. $\overline{CD} \cong \overline{EA}$	4. Given
5. $\overline{CB} \cong \overline{EB}$	5. Definition of segment bisector
6. $\triangle CBD \cong \triangle EBA$	6. HL \cong (steps 3,4,5)

Given: $\overline{HV} \perp \overline{GT}$, $\overline{GH} \cong \overline{TV}$, I is the midpoint of \overline{HV}

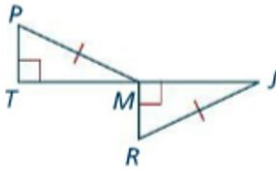
Prove: $\triangle IGH \cong \triangle ITV$



1. $\overline{HV} \perp \overline{GT}$	1. Given
2. $\angle HIG$ and $\angle VIT$ are right angles	2. Definition of perpendicular
3. $\triangle IGH$ and $\triangle ITV$ are right triangles	3. Definition of right triangles
4. $\overline{HG} \cong \overline{TV}$	4. Given
5. I is the midpoint of \overline{HV}	5. Given
6. $\overline{HI} \cong \overline{VI}$	6. Definition of midpoint
7. $\triangle IGH \cong \triangle ITV$	7. HL \cong (steps 3, 4, 6)

Given: $\overline{PM} \cong \overline{RJ}$, $\overline{PT} \perp \overline{TJ}$, $\overline{RM} \perp \overline{TJ}$, M is the midpoint of \overline{TJ} .

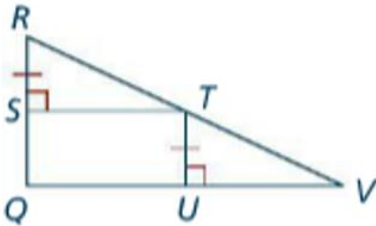
Prove: $\triangle PTM \cong \triangle RMJ$



Statement	Reason
1. $\overline{PT} \perp \overline{TJ}$ and $\overline{RM} \perp \overline{TJ}$	1. Given
2. $\angle PTM$ and $\angle JMR$ are right angles	2. Definition of perpendicular
3. $\triangle PTM$ and $\triangle RMJ$ are right triangles	3. Definition of right triangles
4. $\overline{PM} \cong \overline{RJ}$	4. Given
5. M is the midpoint of \overline{TJ}	5. Given
6. $\overline{TM} \cong \overline{MJ}$	6. Definition of midpoint
7. $\triangle PTM \cong \triangle RMJ$	7. HL \cong (steps 3, 4, 6)

Given: $\overline{RS} \cong \overline{TU}$, $\overline{RS} \perp \overline{ST}$, $\overline{TU} \perp \overline{UV}$,
 T is the midpoint of \overline{RV}

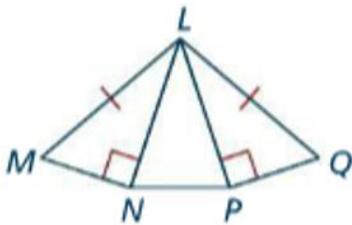
Prove: $\triangle RST \cong \triangle TUV$



Statement	Reason
1. $\overline{RS} \perp \overline{ST}$ and $\overline{TU} \perp \overline{UV}$	1. Given
2. $\angle RST$ and $\angle TUV$ are right angles	2. Definition of perpendicular
3. $\triangle RST$ and $\triangle TUV$ are right triangles	3. Definition of right triangles
4. T is the midpoint of \overline{RV}	4. Given
5. $\overline{RT} \cong \overline{TV}$	5. Definition of midpoint
6. $\overline{RS} \cong \overline{TU}$	6. Given
7. $\triangle RST \cong \triangle TUV$	7. HL \cong (steps 3, 5, 6)

Given: $\triangle LNP$ is isosceles with base \overline{NP} ,
 $\overline{MN} \perp \overline{NL}$, $\overline{QP} \perp \overline{PL}$, $\overline{ML} \cong \overline{QL}$

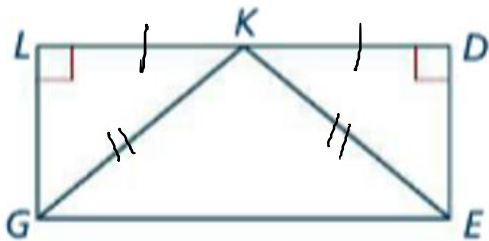
Prove: $\triangle MNL \cong \triangle QPL$



Statement	Reason
1. $\overline{MN} \perp \overline{NL}$ and $\overline{QP} \perp \overline{PL}$	1. Given
2. $\angle MNL$ and $\angle QPL$ are right angles	2. Definition of perpendicular
3. $\triangle MNL$ and $\triangle QPL$ are right triangles	3. Definition of right triangles
4. $\triangle LNP$ is isosceles with base \overline{NP}	4. Given
5. $\overline{LN} \cong \overline{LP}$	5. Definition of Isosceles Triangle
6. $\overline{ML} \cong \overline{QL}$	6. Given
7. $\triangle MNL \cong \triangle QPL$	7. HL \cong (steps 3,5,6)

Given: $\triangle GKE$ is isosceles with base \overline{GE} ,
 $\angle L$ and $\angle D$ are right angles, and
 K is the midpoint of \overline{LD} .

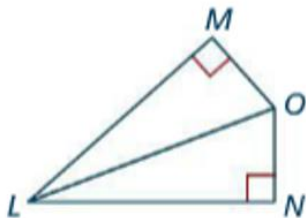
Prove: $\overline{LG} \cong \overline{DE}$



Statement	Reason
1. $\angle L$ and $\angle D$ are right angles	1. Given
2. $\triangle LGK$ and $\triangle DEK$ are right triangles	2. Definition of right triangles
3. $\triangle GKE$ is isosceles with base \overline{GE}	3. Given
4. $\overline{GK} \cong \overline{EK}$	4. Definition of isosceles triangle
5. K is the midpoint of \overline{LD}	5. Given
6. $\overline{LK} \cong \overline{DK}$	6. Definition of midpoint
7. $\triangle LGK \cong \triangle DEK$	7. HL \cong (steps 2, 4, 6)
8. $\overline{LG} \cong \overline{DE}$	8. Corresponding parts of \cong triangles are \cong

Given: \overline{LO} bisects $\angle MLN$, $\overline{OM} \perp \overline{LM}$,
 $\overline{ON} \perp \overline{LN}$

Prove: $\triangle LMO \cong \triangle LNO$



Statement	Reason
1. $\overline{OM} \perp \overline{LM}$ and $\overline{ON} \perp \overline{LN}$	1. Given
2. $\angle LMO$ and $\angle LNO$ are right angles	2. Definition of perpendicular
3. $\angle LMO \cong \angle LNO$	3. Right angles are \cong
4. \overline{LO} bisects $\angle MLN$	4. Given
5. $\angle MLO \cong \angle NLO$	5. Definition of angle bisector
6. $\overline{LO} \cong \overline{LO}$	6. Reflexive property
7. $\triangle LMO \cong \triangle LNO$	7. AAS \cong (steps 3, 5, 6)

