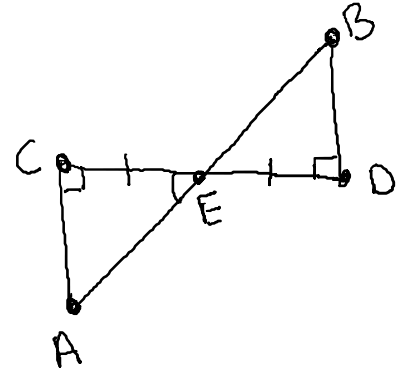


Section 4 Proofs:

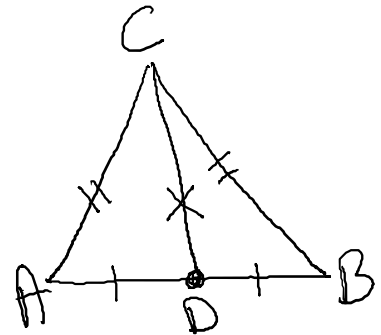
16. Given: \overline{AEB} bisects \overline{CED} , $\overline{AC} \perp \overline{CED}$, and $\overline{BD} \perp \overline{CED}$.
 Prove: $\triangle EAC \cong \triangle EBD$

Statement	Reason
1. $\angle AEC \cong \angle BED$	1. Vertical angles are congruent
2. \overline{AEB} bisects \overline{CED}	2. Given
3. E is the midpoint of \overline{CD}	3. Definition of segment bisector
4. $\overline{CE} \cong \overline{DE}$	4. Definition of midpoint
5. $\overline{AC} \perp \overline{CED}$ $\overline{BD} \perp \overline{CED}$	5. Given
6. $m\angle ACE = m\angle BDE = 90^\circ$	6. Definition of perpendicular segments
7. $\angle ACE \cong \angle BDE$	7. Definition of congruence
8. $\triangle EAC \cong \triangle EBD$	8. ASA \cong (steps 1,4,7)



17. Given: $\triangle ABC$ is equilateral, D is the midpoint of \overline{AB} .
 Prove: $\triangle ACD \cong \triangle BCD$

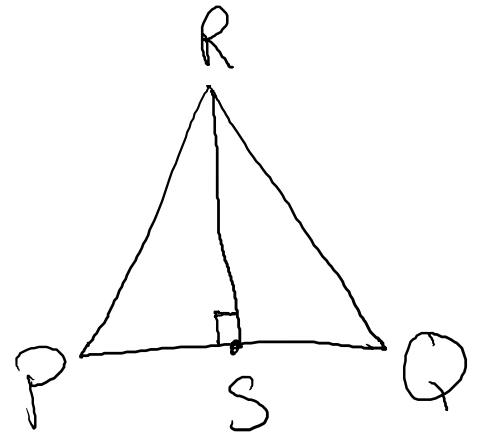
Statement	Reason
1. D is the midpoint of \overline{AB}	1. Given
2. $\overline{AD} \cong \overline{BD}$	2. Definition of midpoint of a segment
3. $\triangle ABC$ is equilateral	3. Given
4. $\overline{AC} \cong \overline{BC}$	4. Definition of equilateral triangle
5. $\overline{CD} \cong \overline{CD}$	5. Reflexive Property
6. $\triangle ACD \cong \triangle BCD$	6. SSS \cong (steps 2,4,5)



18. Given: Triangle PQR with S on \overline{PQ} and $\overline{RS} \perp \overline{PQ}$; $\triangle PSR$ is not congruent to $\triangle QSR$.
 Prove: $PS \neq QS$

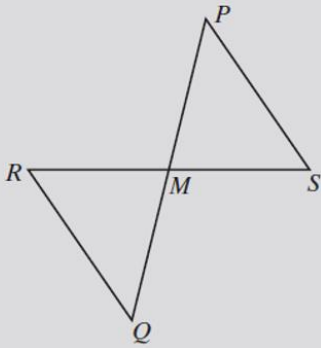
Proof by contradiction, Assume $PS = QS$

Statement	Reason
1. $PS = QS$	1. Assumed to be true
2. $\overline{PS} \cong \overline{QS}$	2. Definition of congruent segments
3. $\overline{RS} \perp \overline{PQ}$	3. Given
4. $\angle PSR$ and $\angle QSR$ are right angles	4. Definition of perpendicular segments
5. $m\angle PSR = 90^\circ$ $m\angle QSR = 90^\circ$	5. Definition of right angles
6. $\angle PSR \cong \angle QSR$	6. Definition of congruent angles .
7. $\overline{SR} \cong \overline{SR}$	7. Reflexive Property
8. $\triangle PSR \cong \triangle QSR$	8. SAS \cong (steps 2,5,6)
9. $\triangle PSR$ is not \cong to $\triangle QSR$	9. Given
10. $PS \neq QS$	10. Step 8 contradicts step 9



11. Given: \overline{PQ} bisects \overline{RS} at M
and $\angle R \cong \angle S$.

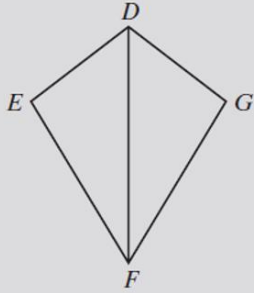
Prove: $\triangle RMQ \cong \triangle SMP$



Statement	Reason
1. $\angle R \cong \angle S$	1. Given
2. \overline{PQ} bisects \overline{RS} at M	2. Given
3. $\overline{RM} \cong \overline{MS}$	3. Definition of segment bisector
4. $\angle RMQ \cong \angle SMP$	4. Vertical angles are \cong
5. $\triangle RMQ \cong \triangle SMP$	5. ASA \cong (steps 1,3,4)

12. Given: Quadrilateral $DEFG$ with
 $DE = DG$ and $EF = GF$.

Prove: $\triangle DEF \cong \triangle DGF$



Statement	Reason
1. $DE = DG$	1. Given
2. $\overline{DE} \cong \overline{DG}$	2. Definition of congruent segments
3. $EF = GF$	3. Given
4. $\overline{EF} \cong \overline{GF}$	4. Definition of congruent segments
5. $\overline{DF} \cong \overline{DF}$	5. Reflexive property
6. $\triangle DEF \cong \triangle DGF$	6. SSS \cong (steps 2,4,5)