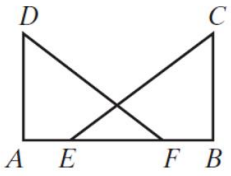
3. *Given:* $\overline{AEFB}, \overline{AE} \cong \overline{FB}, \overline{DA} \cong \overline{CB}$, and $\angle A$ and $\angle B$ are right angles.

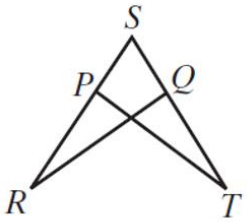
Prove: $\triangle DAF \cong \triangle CBE$ and $\overline{DF} \cong \overline{CE}$



Statement	Reason
1. $\angle A$ and $\angle B$ are right angles	1. Given
2. $\angle A \cong \angle B$	2. All right angles are ≅
3. $\overline{DA} \cong \overline{CB}$	3. Given
4. $\overline{AE} \cong \overline{FB}$	4. Given
5. $AE = FB$	5. Definition of ≅
6. $AF = AE + EF$ $BE = BF + EF$	6. Segment addition postulate
7. $AF = BE$	7. Substitution (steps 5,6)
8. $\overline{AF} \cong \overline{BE}$	8. Definition of ≅
9. $\Delta DAF \cong \Delta CBE$	9. SAS ≅ (steps 2, 4, 9)
10. $\overline{DF} \cong \overline{CE}$	10. Corresponding parts of ≅ triangles are ≅

4. *Given:* $\overline{SPR} \cong \overline{SQT}, \overline{PR} \cong \overline{QT}$

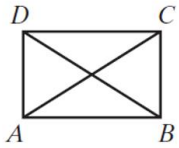
Prove: $\triangle SRQ \cong \triangle STP$ and $\angle R \cong \angle T$



Statement	Reason
1. $\overline{SPR} \cong \overline{SQT}$	1. Given
2. $\angle RSQ \cong \angle TSP$	2. Reflexive property of ≅
3. $\overline{PR} \cong \overline{QT}$	3. Given
4. $SPR = SQT$ $PR = QT$	4. Definition of congruent segments
5. $SPR = SP + PR$ $SQT = SQ + QT$	5. Segment addition postulate
6. $SP = SQ$	6. Substitution (steps 4,5)
7. $\overline{SP} \cong \overline{SQ}$	7. Definition of ≅
8. $\Delta SRQ \cong \Delta STP$	8. SAS ≅ (steps 1,2,7)
9. $\angle R \cong \angle T$	9. Corresponding parts of ≅ triangles are ≅

5. *Given:* $\overline{DA} \cong \overline{CB}$, $\overline{DA} \perp \overline{AB}$, and $\overline{CB} \perp \overline{AB}$

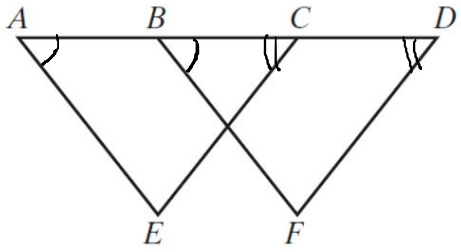
Prove: $\triangle DAB \cong \triangle CBA$ and $\overline{AC} \cong \overline{BD}$



Statement	Reason
1. $\overline{DA} \cong \overline{CB}$	1. Given
2. $\overline{DA} \perp \overline{AB}$ and $\overline{CB} \perp \overline{AB}$	2. Given
3. $\angle DAB$ and $\angle CBA$ are right angles	3. Definition of perpendicular
4. $\angle DAB \cong \angle CBA$	4. All right angle are $\cong$
5. $\overline{AB} \cong \overline{BA}$	5. Reflexive property of $\cong$
6. $\Delta DAB \cong \Delta CBA$	6. SAS $\cong$ (steps 1, 4, 5)
7. $\overline{AC} \cong \overline{BD}$	7. Corresponding parts of $\cong$ triangles are $\cong$

6. *Given:* $\overline{ABCD}$, $\angle BAE \cong \angle CBF$, $\angle BCE \cong \angle CDF$, $\overline{AB} \cong \overline{CD}$

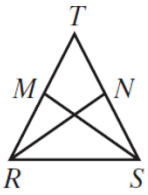
Prove: $\overline{AE} \cong \overline{BF}$ and $\angle E \cong \angle F$



Statement	Reason
1. $\angle BAE \cong \angle CBF$	1. Given
2. $\angle BCE \cong \angle CDF$	2. Given
3. $\overline{AB} \cong \overline{CD}$	3. Given
4. $AB = CD$	4. Definition of congruence
5. $BC = BC$	5. Reflexive property of congruence
6. $AC = AB + BC$ $DB = DC + CB$	6. Segment addition postulate
7. $AC = DB$	7. Substitution (steps 4,5,6)
8. $\overline{AC} \cong \overline{DB}$	8. Definition of congruence
9. $\Delta ACE \cong \Delta BDF$	9. ASA $\cong$ (steps 1,2,8)
10. $\overline{AE} \cong \overline{BF}$ and $\angle E \cong \angle F$	10. Corresponding parts of $\cong$ triangles are $\cong$

7. *Given:* $\overline{TM} \cong \overline{TN}$, M is the midpoint of $\overline{TR}$ and N is the midpoint of $\overline{TS}$.

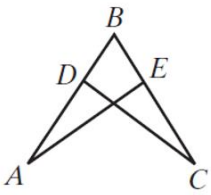
Prove: $\overline{RN} \cong \overline{SM}$



Statement	Reason
1. $\overline{TM} \cong \overline{TN}$	1. Given
2. $TM = TN$	2. Definition of ≅ segments
3. M is the midpoint of $\overline{TR}$ N is the midpoint of $\overline{TS}$	3. Given
4. $TR = 2 \cdot TM$ $TS = 2 \cdot TN$	4. Definition of midpoint
5. $TR = TS$	5. Substitution (steps 2,4)
6. $\overline{TR} \cong \overline{TS}$	6. Definition of ≅ segments
7. $\angle RTN \cong \angle STM$	7. Reflexive property for ≅
8. $\Delta RTN \cong \Delta STM$	8. SAS ≅ (steps 1,6,7)
9. $\overline{RN} \cong \overline{SM}$	9. Corresponding parts of ≅ triangles are ≅

8. *Given:* $\overline{AD} \cong \overline{CE}$ and $\overline{DB} \cong \overline{EB}$

Prove: $\angle ADC \cong \angle CEA$

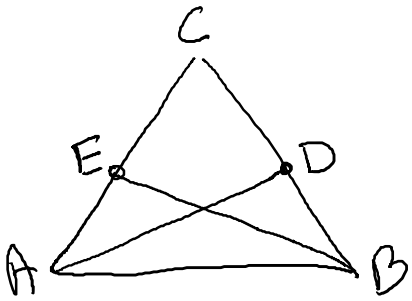


Statement	Reason
1. $\overline{AD} \cong \overline{CE}$ and $\overline{DB} \cong \overline{EB}$	1. Given
2. $AD = CE$ and $DB = EB$	2. Definition of ≅
3. $AB = AD + DB$ $CB = CE + EB$	3. Segment addition postulate
4. $AB = CB$	4. Substitution (steps 2,3)
5. $\overline{AB} \cong \overline{CB}$	5. Definition of ≅ segments
6. $\angle ABE \cong \angle CBD$	6. Reflexive property of ≅
7. $\Delta ABE \cong \Delta CBD$	7. SAS ≅ (steps 1, 5, 6)
8. $\angle BEA \cong \Delta BDC$	8. Corresponding parts of ≅ triangles are ≅
9. $\angle BDC$ and $\angle ADC$ are supplementary $\angle BEA$ and $\angle CEA$ are supplementary	9. Two angles that form l linear pair are supplementary.
10. $\angle ADC \cong \angle CEA$	10. Supplements of ≅ angles are ≅

9. Prove that the angle bisectors of the base angles of an isosceles triangle are congruent.

Given: ΔABC is isosceles with $\overline{AC} \cong \overline{BC}$. $\overline{AD}$ bisects $\angle A$. $\overline{BE}$ bisects $\angle B$.

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



Statement	Reason
1. ΔABC is isosceles with $\overline{AC} \cong \overline{BC}$	1. Given
2. $\angle EAB \cong \angle DBA$	2. Isosceles triangle theorem
3. $m\angle EAB = m\angle DBA$	3. Definition of ≅ angles
4. $\overline{AD}$ bisects $\angle A$. $\overline{BE}$ bisects $\angle B$.	4. Given
5. $m\angle DAB = \frac{1}{2} \cdot m\angle EAB$ $m\angle EBA = \frac{1}{2} \cdot m\angle DBA$	5. Definition of angle bisector
6. $m\angle DAB = m\angle EBA$	6. Substitution (steps 3,5)
7. $\angle DAB \cong \angle EBA$	7. Definition of ≅ angles
8. $\overline{AB} \cong \overline{BA}$	8. Reflexive property of ≅
9. $\Delta ABD \cong \Delta BAE$	9. ASA ≅ (steps 2, 7, 8)
10. $\overline{AD} \cong \overline{BE}$	10. Corresponding parts of ≅ triangles are ≅