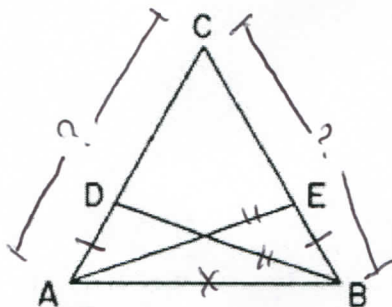


Regents Review Proofs

The following proofs were on old Regents examinations. These will be similar to the proofs that you will see on the Regents exam at the end of the year, so study carefully! Remember that a plan is almost always helpful before you dive right in.

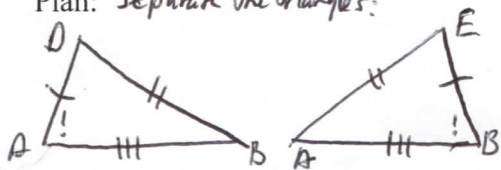
1) (Source: August 1975)

32 Given: $\triangle ABC$, D and E are points on \overline{AC} and \overline{BC} such that $\overline{AD} \cong \overline{BE}$ and $\overline{AE} \cong \overline{BD}$.



Prove: $\overline{AC} \cong \overline{BC}$ [10]

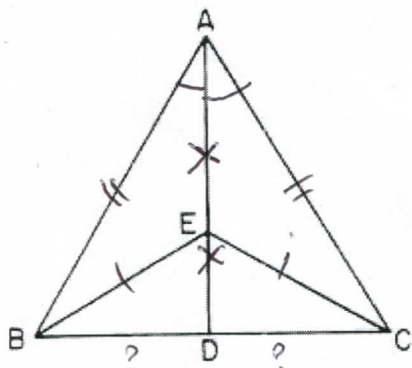
Plan: Separate the triangles:



Use SSS.

2) (Source: January 1986)

32 Given: $\triangle ABC$, \overline{AED} , \overline{BDC} , $\overline{AB} \cong \overline{AC}$, and $\overline{EB} \cong \overline{EC}$.



Prove: \overline{AD} bisects \overline{BC} . [10]

Plan: Use SSS for $\triangle BAE \cong \triangle CAE$.

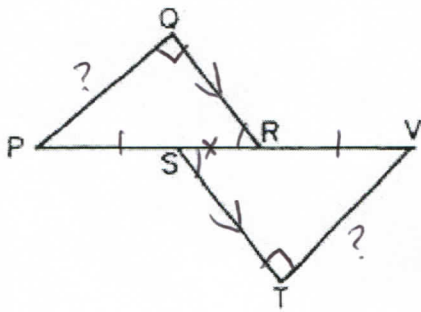
This fulfills the wish for $\triangle BAE \cong \triangle CAE$, so $\triangle BAD \cong \triangle CAD$ by SAS.

Statements	Reasons
1. $\overline{AD} \cong \overline{BE}$ (s \cong s)	1. Given.
2. $\overline{AE} \cong \overline{BD}$ (s \cong s)	2. Given.
3. $\overline{AB} \cong \overline{AB}$ (s \cong s)	3. Reflexive Property.
4. $\triangle DAB \cong \triangle EBA$	4. SSS Postulate.
5. $\angle DAB \cong \angle EBA$	5. Corresponding parts of congruent triangles are congruent.
6. $\overline{AC} \cong \overline{BC}$	6. If two angles of a triangle are congruent, then the sides opposite them are congruent.

Statements	Reasons
1. $\overline{AD} \cong \overline{AC}$ (s \cong s)	1. Given.
2. $\overline{EB} \cong \overline{EC}$ (s \cong s)	2. Given.
3. $\overline{AE} \cong \overline{AE}$ (s \cong s)	3. Reflexive Property.
4. $\triangle BAE \cong \triangle CAE$	4. SSS Postulate.
5. $\overline{AB} \cong \overline{AC}$ (s \cong s)	5. Introduced in step 1.
6. $\angle BAE \cong \angle CAE$ (a \cong a)	6. Corresponding parts of congruent triangles are congruent.
7. $\overline{AD} \cong \overline{AD}$ (s \cong s)	7. Reflexive Property.
8. $\triangle BAD \cong \triangle CAD$	8. SAS Postulate.
9. $\overline{BD} \cong \overline{DC}$	9. Corresponding parts of congruent triangles are congruent.
10. D is the midpoint of \overline{BC}	10. Definition of midpoint.
11. \overline{AD} bisects \overline{BC}	11. Definition of segment bisector.

3) (Source: August 1977)

32 In the diagram, \overline{PSRV} , $\overline{PS} \cong \overline{RV}$, $\overline{QR} \parallel \overline{ST}$,
 $\overline{PQ} \perp \overline{QR}$, and $\overline{VT} \perp \overline{ST}$.



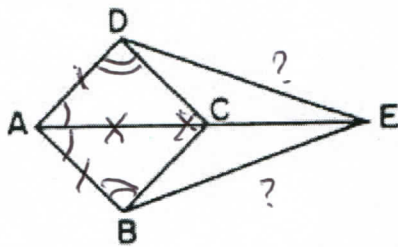
Prove: $\overline{PQ} \cong \overline{TV}$ [10]

Plan: Use AAS Theorem on $\triangle PQR$ and $\triangle VTS$.

Statements	Reasons
1. $\overline{PQ} \perp \overline{QR}$, $\overline{VT} \perp \overline{ST}$	1. Given.
2. $\angle Q$ and $\angle T$ are right angles.	2. Definition of perpendicular lines.
3. $\angle Q \cong \angle T$ ($a \cong a$)	3. All right angles are congruent.
4. $\overline{QR} \parallel \overline{ST}$	4. Given.
5. $\angle QRP \cong \angle TSV$ ($a \cong a$)	5. When parallel lines are cut by a transversal, alternate interior angles are congruent.
6. $\overline{PS} \cong \overline{RV}$	6. Given.
7. $\overline{SR} \cong \overline{SR}$	7. Reflexive Property.
8. $\overline{PS} + \overline{SR} \cong \overline{RV} + \overline{SR}$ or $\overline{PR} \cong \overline{VS}$ ($s \cong s$)	8. Addition Postulate.
9. $\triangle PQR \cong \triangle VTS$	9. AAS Theorem.
10. $\overline{PQ} \cong \overline{TV}$	10. Corresponding parts of congruent triangles are congruent.

4) (Source: June 1981)

32 Given: quadrilateral $ABCD$ with diagonal \overline{AC} extended to point E , \overline{DE} and \overline{BE} are drawn, \overline{AC} bisects $\angle DAB$, $\angle ADC \cong \angle ABC$.



Prove: $\overline{BE} \cong \overline{DE}$ [10]

Plan: Use AAS for $\triangle ADC \cong \triangle ABC$.
 This fulfills the wish for $\overline{AD} \cong \overline{AB}$,
 so $\triangle DAE \cong \triangle BAE$ by SAS.

Statements	Reasons
1. \overline{AC} bisects $\angle DAB$	1. Given.
2. $\angle DAC \cong \angle BAC$ ($a \cong a$)	2. Definition of angle bisector.
3. $\angle ADC \cong \angle ABC$ ($a \cong a$)	3. Given.
4. $\overline{AC} \cong \overline{AC}$ ($s \cong s$)	4. Reflexive Property.
5. $\triangle ADC \cong \triangle ABC$	5. AAS Theorem.
6. $\overline{AD} \cong \overline{BA}$ ($s \cong s$)	6. Corresponding parts of congruent triangles are congruent.
7. $\angle DAC \cong \angle BAC$ ($a \cong a$)	7. Introduced in step 2.
8. $\overline{AE} \cong \overline{AE}$ ($s \cong s$)	8. Reflexive Property.
9. $\triangle DAE \cong \triangle BAE$	9. SAS Postulate.
10. $\overline{BE} \cong \overline{DE}$	10. Corresponding parts of congruent triangles are congruent.