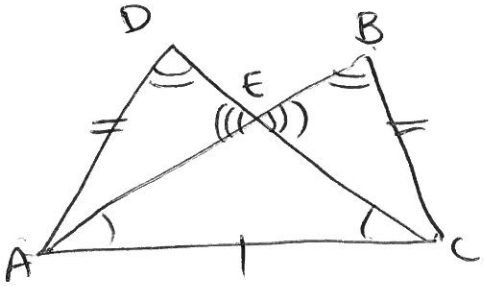
5.

Given: $\angle BAC \cong \angle DCA$

$\angle D \cong \angle B$

Prove: $\triangle ADE \cong \triangle CBE$.

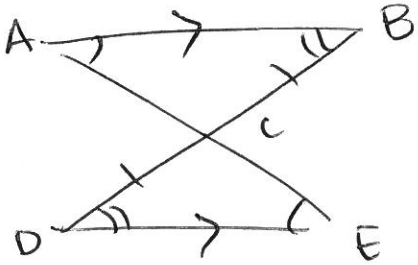


Statements	Reasons
1. $\angle BAC \cong \angle DCA$ $\angle D \cong \angle B$	1. given
2. $\overline{AC} \cong \overline{AC}$	2. reflexive prop
3. ~~$\triangle ABE$~~ $\triangle ABC \cong \triangle CDA$	3. AAS
4. $\overline{AD} \cong \overline{CB}$	4. CPCTC.
5. $\angle DEA \cong \angle BEC$	5. vertical Angles Thm
6. $\triangle ADE \cong \triangle CBE$	6. AAS.

Given: $\overline{AB} \parallel \overline{DE}$

C is midpoint of $\overline{DB}$

Prove: $\triangle ABC \cong \triangle EDC$

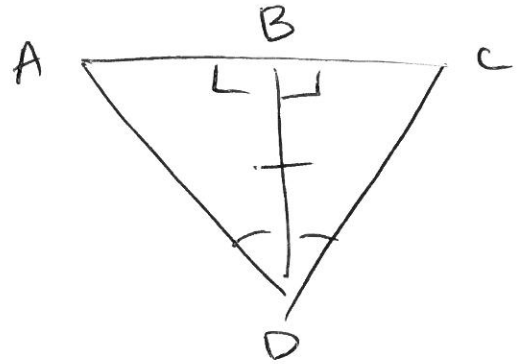


Statements	Reasons
1. $\overline{AB} \parallel \overline{DE}$ C is midpoint of $\overline{DB}$	1. given
2. $\overline{DC} \cong \overline{BC}$	2. Midpoint Thm
3. $\angle A \cong \angle E$ $\angle B \cong \angle D$	3. Alt. Int $\angle$'s thm
4. $\triangle ABC \cong \triangle EDC$	4. AAS

Given: $\overline{BD}$ bisects $\angle ADC$

$\overline{BD} \perp \overline{AC}$

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



Statements	Reasons
1. $\overline{BD}$ bisects $\angle ADC$, $\overline{BD} \perp \overline{AC}$	1. given
2. $\angle ADB \cong \angle CDB$	2. def of bisector
3. $\angle ABD$ and $\angle CBD$ are right angles	3. Def of $\perp$ lines
4. $\angle ABD \cong \angle CBD$	4. right $\angle$'s are congruent.
5. $\overline{BD} \cong \overline{BD}$	5. reflexive prop.
6. $\triangle ABD \cong \triangle CBD$	6. ASA
7. $\overline{AD} \cong \overline{CD}$	7. CPCTC.

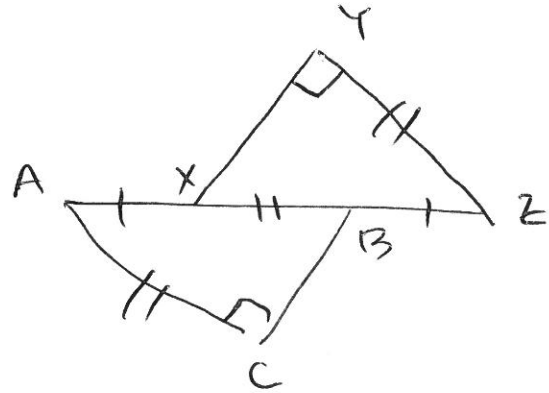
2. Given:

$\overline{AC} \perp \overline{CB}$, $\overline{XY} \perp \overline{YZ}$

$\overline{AC} \cong \overline{YZ}$, $\overline{AX} \cong \overline{BZ}$

Prove:

$\overline{CB} \cong \overline{XY}$



Statements	Reasons
1. $\overline{AC} \perp \overline{CB}$ $\overline{XY} \perp \overline{YZ}$ $\overline{AC} \cong \overline{YZ}$ $\overline{AX} \cong \overline{BZ}$	1. given
2. $\angle ACB$ and $\angle ZYX$ are right angles	2 Def of $\perp$ lines
3. $\triangle ACB$ and $\triangle XYZ$ are right $\triangle$s	3. Def of right $\triangle$.
4. $\overline{XB} \cong \overline{XB}$	4. reflexive prop
5. $AX + XB = AB$ $ZB + BX = ZX$	5. Segment addition postulate.
6. $AB = ZX$	6. Substitution
7. $\overline{AB} \cong \overline{ZX}$	7 def of $\cong$
8. $\triangle ACB \cong \triangle ZYX$	8. HL
9. $\overline{CB} \cong \overline{XY}$	9. CPCTC.

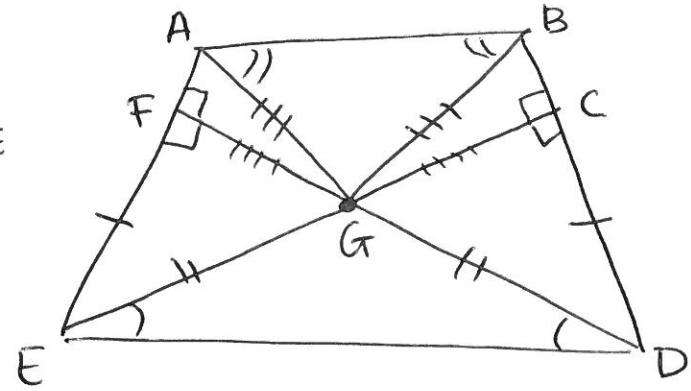
4. Given:

$\overline{GF} \perp \overline{AE}$ $\quad \angle GAB \cong \angle GBA$

$\overline{GC} \perp \overline{BD}$ $\quad \angle GED \cong \angle GDE$

$\overline{EF} \cong \overline{DC}$ $\quad \overline{EG} \cong \overline{DG}$

$\overline{AG} \cong \overline{BG}$



Statements	Reasons
1. $\overline{GF} \perp \overline{AE}$ $\overline{GC} \perp \overline{BD}$ $\overline{EF} \cong \overline{DC}$ $\overline{EG} \cong \overline{DG}$ $\overline{AG} \cong \overline{BG}$ $\angle GAB \cong \angle GBA$ $\angle GED \cong \angle GDE$	1. given
2. $\angle GFE$ and $\angle GCD$ are right angles	2. Def of $\perp$ lines
3. $\triangle GFE$ and $\triangle GCD$ are right triangles	3. Def of right $\triangle$s
4. $\triangle GFE \cong \triangle GCD$	4. HL
5. $\overline{GF} \cong \overline{GC}$	5. CPCTC
6. $\angle GFA$ and $\angle GCB$ are right angles	6. Def of $\perp$ lines
7. $\triangle GFA$ and $\triangle GCB$ are right triangles	7. Def of right $\triangle$'s
8. $\triangle GFA \cong \triangle GCB$	8. HL

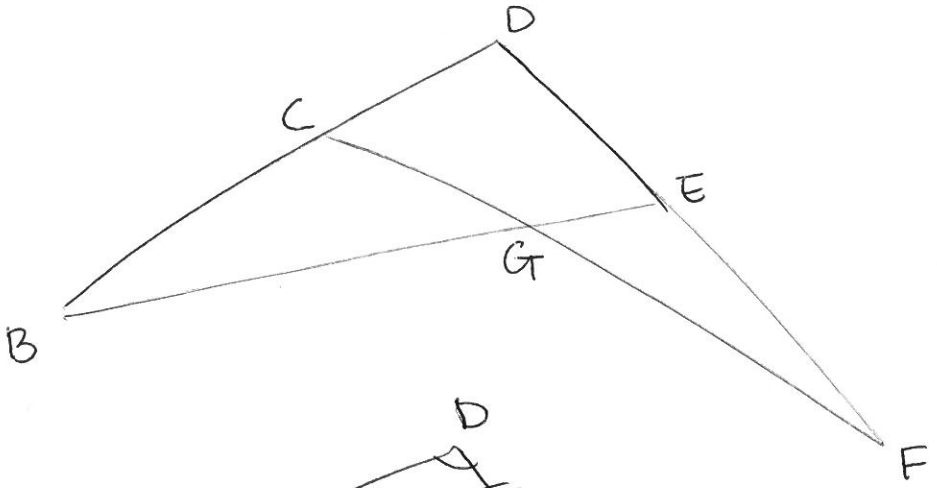
Given:

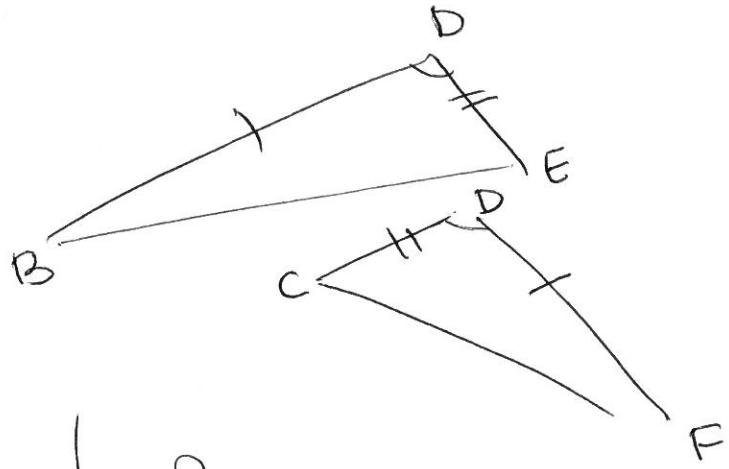
$\overline{BD} \cong \overline{DF}$

$\overline{CD} \cong DE$

Prove:

$\overline{BE} \cong \overline{FC}$





Statements	Reasons
1. $\overline{BD} \cong \overline{DF}$ $\overline{CD} \cong \overline{DE}$	1. given
2. $\angle D \cong \angle D$	2. reflexive property
3. $\triangle BDE \cong \triangle FDC$	3. SAS
4. $\overline{BE} \cong \overline{FC}$	4. CPCTC.