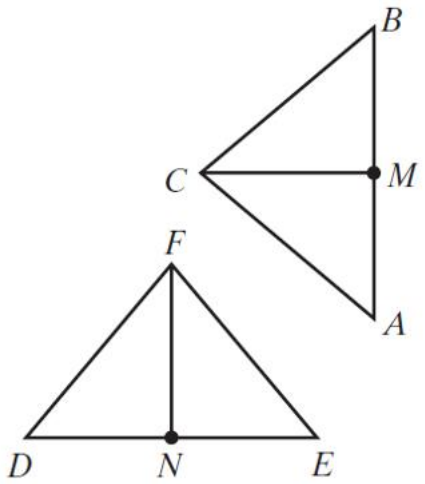
3. *Given:* $\triangle ABC \cong \triangle DEF$, M is th
midpoint of $\overline{AB}$, and N is
the midpoint of $\overline{DE}$.

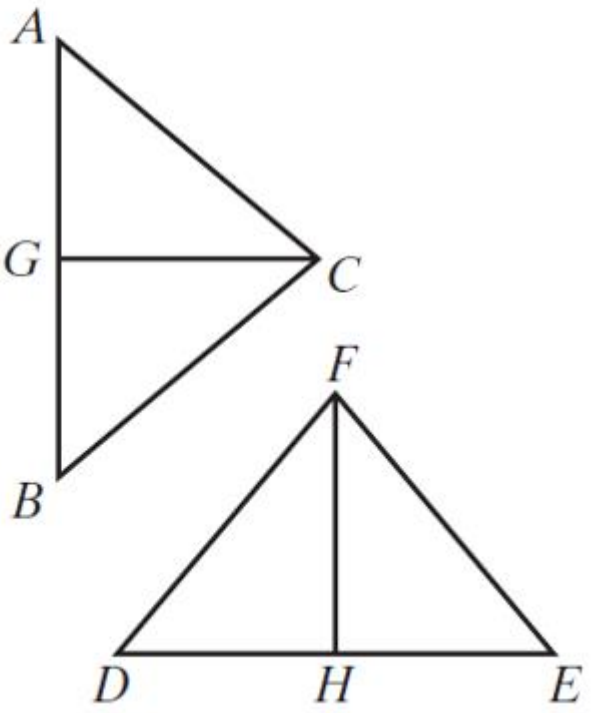
Prove: $\triangle AMC \cong \triangle DNF$



Statement	Reason
1. $\Delta ABC \cong \Delta DEF$	1. Given
2. $\overline{DF} \cong \overline{AC}$	2. Corresponding parts of ≅ triangles are ≅
3. $\angle D \cong \angle A$	3. Corresponding parts of ≅ triangles are ≅
4. $\overline{DE} \cong \overline{AB}$	4. Corresponding parts of ≅ triangles are ≅
5. $DE = AB$	5. Definition of ≅ segments
6. M is the midpoint of $\overline{AB}$ N is the midpoint of $\overline{DE}$	6. Given
7. $\frac{1}{2}DE = DN$ $\frac{1}{2}AB = AM$	7. Definition of midpoint
8. $DN = AM$	8. Substitution
9. $\overline{DN} \cong \overline{AM}$	9. Definition of congruent segments
10. $\Delta AMC \cong \Delta DNF$	10. SAS ≅ (steps 2,3,9)

4. *Given:* $\triangle ABC \cong \triangle DEF, \overline{CG}$ bisects $\angle ACB$, and $\overline{FH}$ bisects $\angle DFE$.

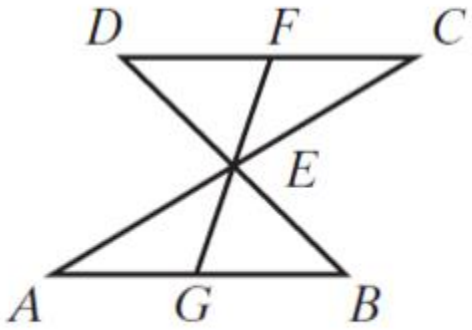
Prove: $\overline{CG} \cong \overline{FH}$



Statement	Reason
1. $\Delta ABC \cong \Delta DEF$	1. Given
2. $\angle A \cong \angle D$ and $\overline{AC} \cong \overline{DF}$	2. Corresponding parts of ≅ triangles are ≅
3. $\overline{CG}$ bisects $\angle ACB$ $\overline{FH}$ bisects $\angle DFE$	3. Given
4. $m\angle ACG = \frac{1}{2} \cdot m\angle ACB$ $m\angle DFH = \frac{1}{2} \cdot m\angle DFE$	4. Definition of angle bisector
5. $m\angle ACG = m\angle DFH$	5. Substitution
6. $\angle ACG \cong \angle DFH$	6. Definition of congruent angles
7. $\Delta DFH \cong \Delta ACG$	7. ASA ≅ (steps 2,6)

5. *Given:* $\overline{AEC}$ and $\overline{DEB}$ bisect each other, $\overline{FEG}$ intersects $\overline{AB}$ at G and $\overline{CD}$ at F.

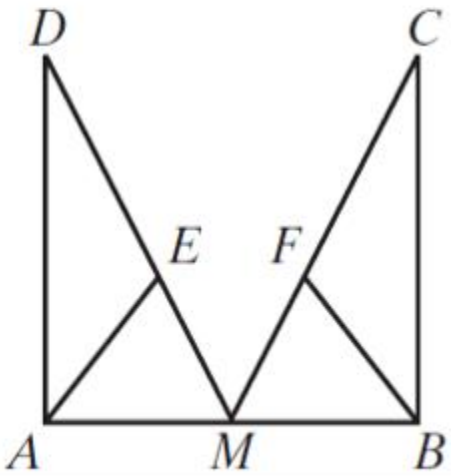
Prove: E is the midpoint of $\overline{FEG}$.



Statement	Reason
1. $\overline{AEC}$ and $\overline{DEB}$ bisect each other	1. Given
2. $\overline{DE} \cong \overline{BE}$ and $\overline{AE} \cong \overline{CE}$	2. Definition of segment bisector
3. $\angle AEB \cong \angle CED$	3. Vertical angles are ≅
4. ΔAEB $\cong \Delta CED$	4. SAS ≅ (steps 2,3)
5. $\angle A \cong \angle C$	5. Corresponding parts of ≅ triangles are ≅
6. $\angle AEG \cong \angle CEF$	6. Vertical angles are ≅
7. $\Delta AEG \cong \Delta CEF$	7. ASA ≅ (steps 2,5,6)
8. $\overline{FE} \cong \overline{GE}$	8. Corresponding parts of ≅ triangles are ≅
9. E is the midpoint of $\overline{FEG}$	9. Definition of midpoint

6. *Given:* $\triangle AME \cong \triangle BMF$ and $\overline{DE} \cong \overline{CF}$

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



Statement	Reason
1. $\Delta AME \cong \Delta BMF$	1. Given
2. $\overline{AM} \cong \overline{BM}$	2. Corresponding parts of ≅ triangles are ≅
3. $\angle AMD \cong \angle BMC$	3. Corresponding parts of ≅ triangles are ≅
4. $\overline{EM} \cong \overline{FM}$	4. Corresponding parts of ≅ triangles are ≅
5. $\overline{DM} \cong \overline{CM}$	5. Given
6. $EM = FM$ $DE = CF$	6. Definition of congruent segments
7. $DM = DE + EM$ $CM = CF + FM$	7. Segment addition postulate
8. DM=CM	8. Substitution (steps 6,7)
9. $\overline{DM} \cong \overline{CM}$	9. Definition of ≅ segments
10. $\Delta ADM \cong \Delta BCM$	10. SAS ≅ (steps 2,3,9)
11. $\overline{AD} \cong \overline{BC}$	11. Corresponding parts of ≅ triangles are ≅

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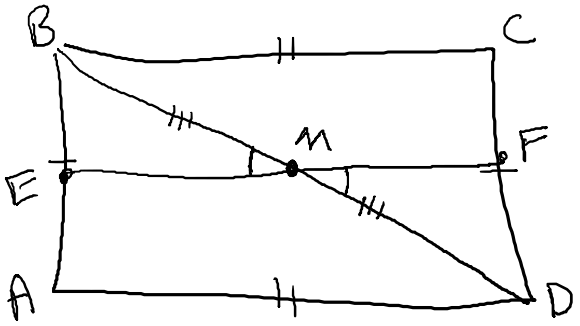
9. In quadrilateral $ABCD$, $AB = CD$, $BC = DA$, and M is the midpoint of $\overline{BD}$. A line segment through M intersects $\overline{AB}$ at E and $\overline{CD}$ at F. Prove that $\overline{BMD}$ bisects $\overline{EMF}$ at M.



Statement	Reason
1. $AB = CD, BC = DA$	1. Given
2. $\overline{AB} \cong \overline{CD}$, and $\overline{BC} \cong \overline{DA}$	2. Definition of congruent segments
3. $\overline{BD} \cong \overline{BD}$	3. Reflexive property
4. $\Delta ABD \cong \Delta CDB$	4. SSS $\cong$ (steps 2,3)
5. $\angle ABD \cong \angle CDB$	5. Corresponding parts of $\cong$ triangles are $\cong$
6. M is the midpoint of $\overline{BD}$	6. Given
7. $\overline{BM} \cong \overline{DM}$	7. Definition of midpoint
8. $\angle EMB \cong \angle FMD$	8. Vertical angles are $\cong$
9. $\Delta EBM \cong \Delta FDM$	9. ASA $\cong$ (steps 5,7,8)
10. $\overline{EM} \cong \overline{FM}$	10. Corresponding parts of $\cong$ triangles are $\cong$
11. $\overline{BMD}$ bisects $\overline{EMF}$ at M	11. Definition of segment bisector