**Geometry Honors**
**Proof Template**

Name Key

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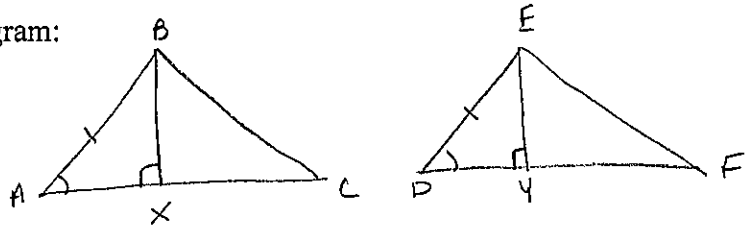
Diagram:




Given: $\triangle ABC \cong \triangle DEF$
$\overline{BX} \perp \overline{AC}$ ; $\overline{EY} \perp \overline{DF}$

Prove: $\overline{BX} \cong \overline{EY}$

| Statement | Reason |
|---|---|
| 1. $\triangle ABC \cong \triangle DEF$ ; $\overline{BX} \perp \overline{AC}$ ; $\overline{EY} \perp \overline{DF}$ | 1. Given |
| 2. $\angle BXA + \angle EYD$ rt. $\angle$s | 2. def $\perp$ |
| 3. $\angle BXA \cong \angle EYD$ | 3. All rt. $\angle$s $\cong$ |
| 4. $\overline{AB} \cong \overline{DE}$ ; $\angle A \cong \angle D$ | 4. CPCTC |
| 5. $\triangle BXA \cong \triangle EYD$ | 5. AAS |
| 6. $\overline{BX} \cong \overline{EY}$ | 6. CPCTC |
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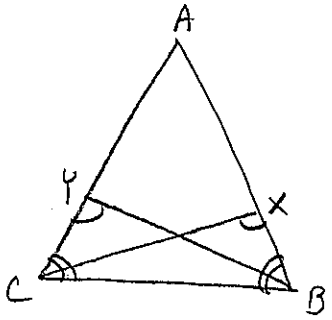
Diagram:




Given: $\triangle ABC$ is isosc. with vertex A
$\overline{CX} \perp \overline{AB}$ ; $\overline{BY} \perp \overline{AC}$

Prove: $\overline{CX} \cong \overline{BY}$

| Statement | Reason |
|---|---|
| 1. $\triangle ABC$ is isosc. with vertex A | 1. Given |
| $\overline{CX} \perp \overline{AB}$; $\overline{BY} \perp \overline{AC}$ | |
| 2. $\angle BYC$ is rt. $\angle$; $\angle BXC$ is rt. $\angle$ | 2. def. $\perp$ |
| 3. $\angle BYC \cong \angle BXC$ | 3. All rt. $\angle$s $\cong$ |
| 4. $\overline{AC} \cong \overline{AB}$ | 4. def. isosc. $\triangle$ |
| 5. $\angle ACB \cong \angle ABC$ | 5. Isosc. $\triangle$ Thm. |
| 6. $\overline{CB} \cong \overline{CB}$ | 6. Reflexive |
| 7. $\triangle CYB \cong \triangle BXC$ | 7. AAS |
| 8. $\overline{CX} \cong \overline{BY}$ | 8. CPCTC |
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**Geometry Honors**
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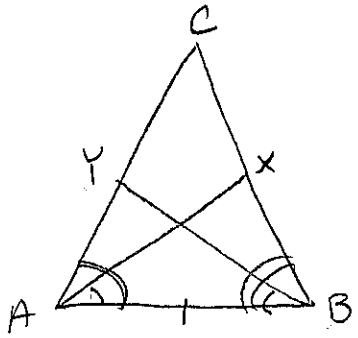
Diagram:




Given: $\triangle ABC$ is isosc. w/ vertex C
$\overline{AX}$ bisects $\angle CAB$
$\overline{BY}$ bisects $\angle ABC$

Prove: $\overline{AX} \cong \overline{BY}$

| Statement | Reason |
|---|---|
| 1. $\triangle ABC$ is isosc. w/ Vertex C | 1. Given |
| 2. $\angle CAB \cong \angle CBA$ | 2. def. isosc. $\triangle$ |
| 3. $m\angle XAB = \frac{1}{2} m\angle CAB$ | 3. $\angle$ bis. Thm. |
| $m\angle YBA = \frac{1}{2} m\angle CBA$ | |
| 4. $m\angle CAB = m\angle CBA$ | 4. def. $\cong$ |
| 5. $m\angle YBA = \frac{1}{2} m\angle CAB$ | 5. Subst. |
| 6. $m\angle YBA = m\angle CAB$ | 6. Subst. |
| 7. $\angle YBA \cong \angle CAB$ | 7. def. $\cong$ |
| 8. $\overline{AB} \cong \overline{AB}$ | 8. Reflexive |
| 9. $\triangle AXB \cong \triangle BYA$ | 9. ASA |
| 10. $\overline{AX} \cong \overline{BY}$ | 10. CPCTC |
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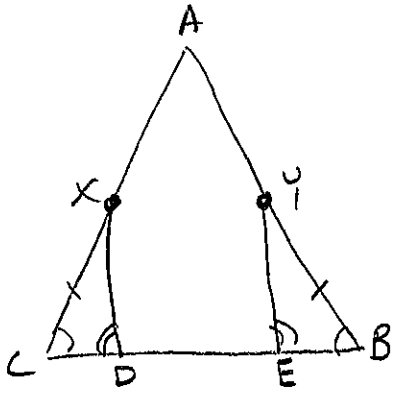
Diagram:




Given: $\triangle ABC$ is Isosc. w/ vertex A
X is mdpt. of $\overline{AC}$; Y is mdpt. of $\overline{AB}$
$\overline{XD} \perp \overline{CB}$; $\overline{YE} \perp \overline{CB}$

Prove: $\overline{XD} \cong \overline{YE}$

| Statement | Reason |
|---|---|
| 1. $\triangle ABC$ is isosc. w/ vertex A | 1. Given |
| 2. $\overline{AC} \cong \overline{AB}$ | 2. def. isosc. $\triangle$ |
| 3. $\angle C \cong \angle B$ | 3. isosc. $\triangle$ Thm. |
| 4. X is mdpt. of $\overline{AC}$; Y is mdpt. of $\overline{AB}$ | 4. Given |
| 5. $CX = \frac{1}{2} AC$; $BY = \frac{1}{2} AB$ | 5. Mdpt. Thm. |
| 6. $AC = AB$ | 6. def. $\cong$ |
| 7. $CX = \frac{1}{2} AB$ | 7. Subst. |
| 8. $CX = BY$ | 8. Subst. |
| 9. $\overline{CX} \cong \overline{BY}$ | 9. def. $\cong$ |
| 10. $\angle XDC$ & $\angle YEB$ rt. $\angle$s | 10. def. $\perp$ |
| 11. $\angle XDC \cong \angle YEB$ | 11. All rt. $\angle$s $\cong$ |
| 12. $\triangle XDC \cong \triangle YEB$ | 12. AAS |
| 13. $\overline{XD} \cong \overline{YE}$ | 13. CPCTC |
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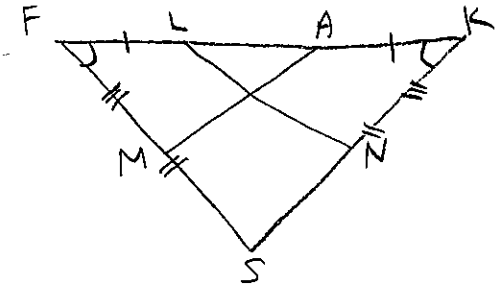
Given: $\overline{FL} \cong \overline{AK}$; $\overline{SF} \cong \overline{SK}$
M is mdpt. of $\overline{SF}$
N is mdpt. of $\overline{SK}$

Prove: $\overline{AM} \cong \overline{LN}$

Diagram:




| | Statement | Reason |
|---|---|---|
| | 1. $\overline{FL} \cong \overline{AK}$; $\overline{SF} \cong \overline{SK}$ | 1. Given |
| (A) | 2. $\angle F \cong \angle K$ | 2. Isosc. $\triangle$ Thm. |
| | 3. $FL = AK$; $SF = SK$ | 3. def. $\cong$ |
| | 4. $LA = LA$ | 4. Reflexive |
| | 5. $FL + LA = AK + LA$ | 5. Add'n Prop. = |
| | 6. $FL + LA = FA$; $AK + LA = LK$ | 6. Seg. Add'n Post. |
| | 7. $FA = LK$ | 7. Subst. |
| (S) | 8. $\overline{FA} \cong \overline{LK}$ | 8. def. $\cong$ |
| | 9. M is mdpt. of $\overline{SF}$; N is mdpt. of $\overline{SK}$ | 9. Given |
| | 10. $FM = \frac{1}{2} SF$; $KN = \frac{1}{2} SK$ | 10. Mdpt. Thm. |
| | 11. $FM = \frac{1}{2} SK$ | 11. Subst. |
| | 12. $KN = FM$ | 12. Subst. |
| (S) | 13. $\overline{KN} \cong \overline{FM}$ | 13. def. $\cong$ |
| | 14. $\triangle FMA \cong \triangle KNL$ | 14. SAS |
| | 15. $\overline{AM} \cong \overline{LN}$ | 15. CPCTC |