4.2

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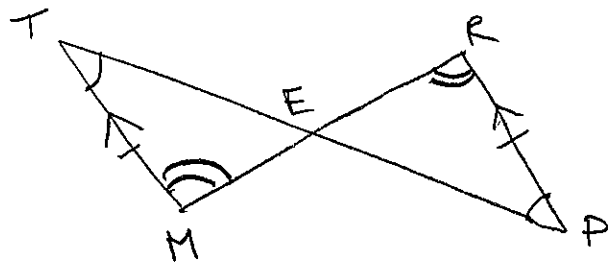
Given: $\overline{TM} \cong \overline{PR}$
$\overline{TM} \parallel \overline{RP}$

Diagram:



Prove: $\triangle TEM \cong \triangle PER$

	Statement	Reason
5	1. $\overline{TM} \cong \overline{PR}$; $\overline{TM} \parallel \overline{RP}$	1. Given
4 A	2. $\angle M \cong \angle R$; $\angle T \cong \angle P$	2. $\parallel$ lines → alt. int. $\angle$s $\cong$
	3. $\triangle TEM \cong \triangle PER$	3. ASA

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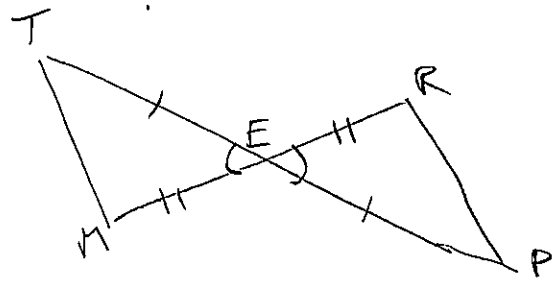
Diagram:



Given: E is the mdpt. of $\overline{TP}$
E is the mdpt. of $\overline{MR}$

Prove: $\triangle TEM \cong \triangle PER$

Statement	Reason
1. E is the mdpt. of $\overline{TP}$	1. Given
E is the mdpt. of $\overline{MR}$	
S 2. $\overline{TE} \cong \overline{EP}$, $\overline{ME} \cong \overline{ER}$	2. def. mdpt.
A 3. $\angle TEM \cong \angle REP$	3. Vert. $\angle$s $\cong$
4. $\triangle TEM \cong \triangle PER$	4. SAS

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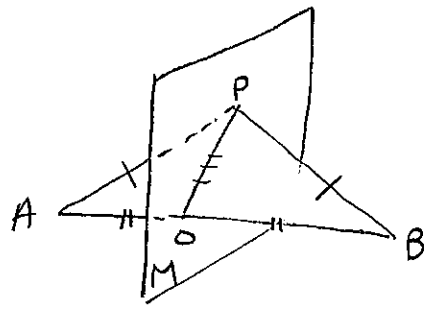
Diagram:



Given: Plane M bisects $\overline{AB}$
$\overline{PA} \cong \overline{PB}$

Prove: $\triangle POA \cong \triangle POB$

	Statement	Reason
3	1. Plane M bisects $\overline{AB}$; $\overline{PA} \cong \overline{PB}$	1. Given
	2. O is mdpt. of $\overline{AB}$	2. def. bisect
5	3. $\overline{AO} \cong \overline{OB}$	3. def. mdpt.
5	4. $\overline{PO} \cong \overline{PO}$	4. Reflexive
	5. $\triangle POA \cong \triangle POB$	5. SSS

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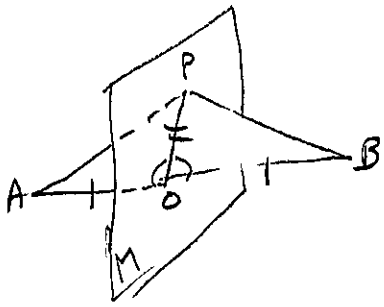
Diagram:



Given: Plane M bisects $\overline{AB}$
$\overline{PO} \perp \overline{AB}$

Prove: $\triangle POA \cong \triangle POB$

	Statement	Reason
	1. Plane M bisects $\overline{AB}$; $\overline{PO} \perp \overline{AB}$	1. Given
	2. O is mdpt. of $\overline{AB}$	2. def. segment bisector
(S)	3. $\overline{AO} \cong \overline{OB}$	3. def. mdpt.
(A)	4. $\angle POA \cong \angle POB$	4. $\perp$ lines $\rightarrow \cong$ adj. $\angle$s
(S)	5. $\overline{PO} \cong \overline{PO}$	5. Reflexive
	6. $\triangle POA \cong \triangle POB$	6. SAS

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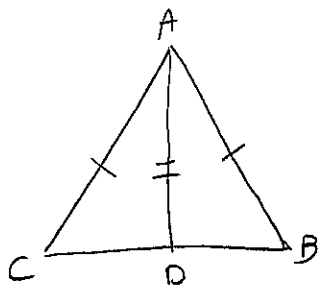
Given: $\triangle ABC$ is isosc. with vertex A
$\overline{AD}$ bisects $\angle CAB$

Prove: $\triangle ADC \cong \triangle ADB$

Diagram:



	Statement	Reason
	1. $\triangle ABC$ is isosc. with vertex A	1. Given
S	2. $\overline{AC} \cong \overline{AB}$	2. def. isosc. $\triangle$
	3. $\overline{AD}$ bisects $\angle CAB$	3. Given
A	4. $\angle CAD \cong \angle BAD$	4. def. $\angle$ bis.
S	5. $\overline{AD} \cong \overline{AD}$	5. Reflexive
	6. $\triangle ADC \cong \triangle ADB$	6. SAS

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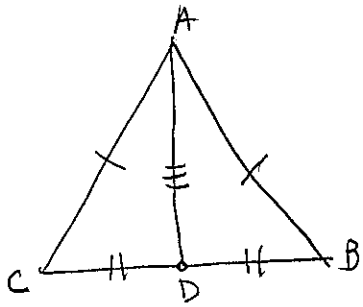
Diagram:



Given: $\triangle ABC$ is isosc. w/Vertex A
D is the mdpt. of $\overline{CB}$

Prove: $\triangle ADC \cong \triangle ADB$

	Statement	Reason
	1. $\triangle ABC$ is isosc. w/Vertex A	1. Given
S	2. $\overline{AC} \cong \overline{AB}$	2. def. isosc. $\triangle$
	3. D is mdpt. of $\overline{CB}$	3. Given
S	4. $\overline{CD} \cong \overline{DB}$	4. def. mdpt.
S	5. $\overline{AD} \cong \overline{AD}$	5. Reflexive
	6. $\triangle ADC \cong \triangle ADB$	6. SSS

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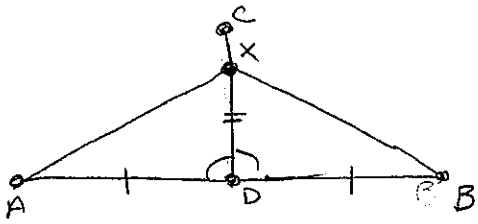
Diagram:



Given: $\overline{CD} \perp \overline{AB}$
D is mdpt. of $\overline{AB}$

Prove: $\triangle AXD \cong \triangle BXD$

	Statement	Reason
	1. $\overline{CD} \perp \overline{AB}$	1. Given
A	2. $\angle XDA \cong \angle XDB$	2. $\perp$ lines $\rightarrow \cong$ adj. $\angle$s
	3. D is mdpt. of $\overline{AB}$	3. Given
S	4. $\overline{AD} \cong \overline{DB}$	4. def. mdpt,
S	5. $\overline{XD} \cong \overline{XD}$	5. Reflexive
	6. $\triangle AXD \cong \triangle BXD$	6. SAS

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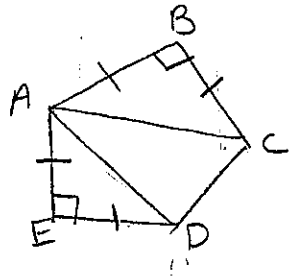
Diagram:



Given: Pentagon ABCDE is equil.
$\angle B$ + $\angle E$ rt. $\angle$s

Prove: $\triangle ABC \cong \triangle AED$

	Statement	Reason
	1. Pent. ABCD is equil.	1. Given
(S)(S)	2. $\overline{AB} \cong \overline{BC} \cong \overline{AE} \cong \overline{ED}$	2. def. equil.
	3. $\angle B + \angle E$ rt. $\angle$s	3. Given
	4. $m\angle B = 90$; $m\angle E = 90$	4. def. rt. $\angle$
	5. $m\angle B = m\angle E$	5. subst.
(A)	6. $\angle B \cong \angle E$	6. def. $\cong$
	7. $\triangle ABC \cong \triangle AED$	7. SAS