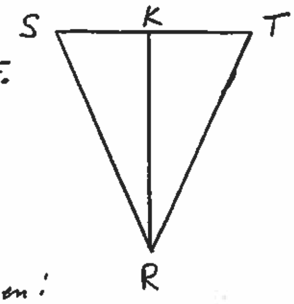
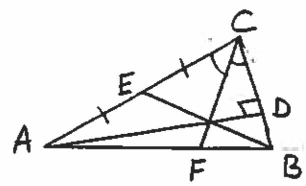
A#36 $\boxed{\text{Pt I}}$ p. 155 CE #1-9 | Key

$\boxed{\text{Pt II}}$ p. 156-157 WE #7-13, 18, 20-23

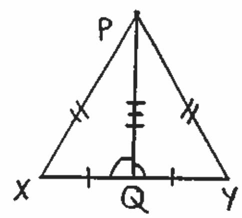
$\boxed{\text{Pt I}}$ p. 155 CE #1-9



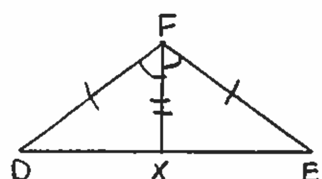
1. If K is the midpt of $\overline{ST}$, then $\overline{RK}$ is called a <u>median</u> of $\triangle RST$.
2. If $\overline{RK} \perp \overline{ST}$, then $\overline{RK}$ is called an <u>altitude</u> of $\triangle RST$.
3. If K is the midpt of $\overline{ST}$ and $\overline{RK} \perp \overline{ST}$, then $\overline{RK}$ is called a <u>Perpendicular bisector</u> of $\overline{ST}$.
4. If $\overline{RK}$ is both an altitude and a median of $\triangle RST$, then:
   a. $\triangle RSK \cong \triangle RTK$ by <u>SAS $\cong$ Post</u> b. $\triangle RST$ is an <u>isosceles</u> $\triangle$.
5. If R is on the $\perp$ bisector of $\overline{ST}$, then R is equidistant from <u>S</u> and <u>T</u>. Thus <u>RS</u> = <u>RT</u>.



6. a. a median of $\triangle ABC \rightarrow$ <u>$\overline{BE}$</u>
   b. an altitude of $\triangle ABC \rightarrow$ <u>$\overline{AD}$</u>
   c. a bisector of an angle of $\triangle ABC \rightarrow$ <u>$\overline{CF}$</u>



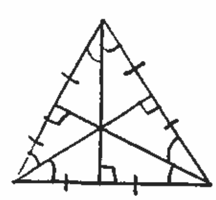
7. a. Draw $\overline{XY}$, midpt Q, equidistant point P.
   b. $\triangle PQX \cong \triangle PQY$ by <u>SSS $\cong$ Post</u>
   c. $\angle PQX \cong \angle PQY$ by <u>CPCTC</u>
   d. $\overleftrightarrow{PQ} \perp \overleftrightarrow{XY}$ by <u>2 Lines form $\cong$ adj $\angle$s $\rightarrow \perp$ lines</u>
   e. $\overleftrightarrow{PQ}$ is a <u>Perpendicular bisector</u>



8. Given: $\triangle DEF$ is isosceles with DF = EF, $\overline{FX}$ bisects $\angle DFE$
   a. Since the $\triangle$s would be $\cong$ by SAS $\cong$ Post, $\overline{DX} \cong \overline{EX}$ [CPCTC] and X ends up being the midpt of $\overline{DE}$. $\therefore$ <u>$\overline{FX}$ is a Median!</u>
   b. $\angle DXF \cong \angle EXF$ [CPCTC] so $\overline{FX} \perp \overline{DE}$ [2 lines form $\cong$ adj $\angle$s $\rightarrow \perp$ lines]
   $\therefore$ <u>$\overline{FX}$ is also an altitude</u> and <u>a $\perp$ bisector</u>.

* In an isosceles $\triangle$, the bisector of the vertex $\angle$ is also a median, an altitude, and a $\perp$ bisector!

9. What kind of $\triangle$ has three angle bisectors that are also altitudes and medians?
   <u>Equilateral $\triangle$</u>



A#36 continued

Key

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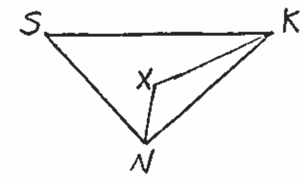
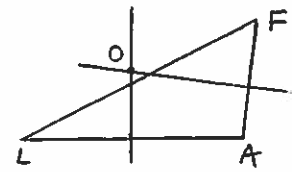


7. If X is on the bisector of $\angle SKN$, then X is equidistant from $\overrightarrow{KS}$ and $\overrightarrow{KN}$. [$\angle$ bisector Thm #2]

8. If X is on the bisector of $\angle SNK$, then X is equidistant from $\overrightarrow{NS}$ and $\overrightarrow{NK}$. [$\angle$ bisector Thm #2]

9. If X is equidistant from $\overline{SK}$ and $\overline{SN}$, then X lies on the bisector of $\angle S$. [$\angle$ bisector Thm #2]



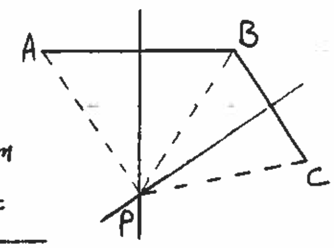
10. If O is on the $\perp$ bisector of $\overline{LA}$, then O is equidistant from L and A. [$\perp$ bisector Thm]

11. If O is on the $\perp$ bisector of $\overline{AF}$, then O is equidistant from A and F. [$\perp$ bisector Thm]

12. If O is equidistant from L and F, then O lies on the $\perp$ bisector of $\overline{LF}$. [$\perp$ bisector Thm]

13. Given: P is on the $\perp$ bisector of both $\overline{AB}$ and $\overline{BC}$

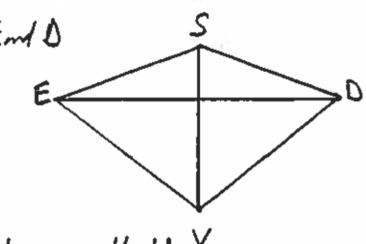
Prove: PA = PC



Statements	Reasons
① P is on the $\perp$ bisector of $\overline{AB}$ and $\overline{BC}$	① Given
② PA = PB , PB = PC	② $\perp$ bisector Thm
③ PA = PC	③ Trans. Prop. of =

18. Given: S is equidistant from E and D; V is equidistant from E and D

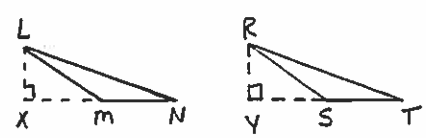
Prove: $\overleftrightarrow{SV}$ is the $\perp$ bisector of $\overline{ED}$



Statements	Reasons
① S and V are equidistant from E and D	① Given
② S and V are on the $\perp$ bisector of $\overline{ED}$	② $\perp$ bisector Thm
③ $\overleftrightarrow{SV}$ is the $\perp$ bisector of $\overline{ED}$	③ Through any 2 points $\exists$ exactly 1 line.

20. Given: $\triangle LMN \cong \triangle RST$; $\overline{LX}$ and $\overline{RY}$ are altitudes

Prove: $\overline{LX} \cong \overline{RY}$

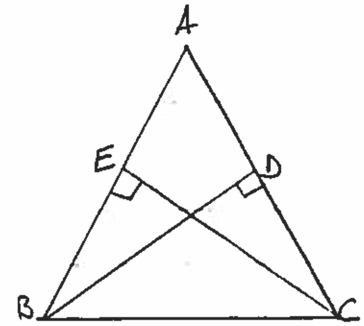


Statements	Reasons
① $\triangle LMN \cong \triangle RST$; $\overline{LX}$ and $\overline{RY}$ are altitudes	① Given
② $\overline{LX} \perp \overline{XN}$, $\overline{RY} \perp \overline{YT}$	② Def. of altitude
③ $\angle X$ and $\angle Y$ are rt. $\angle$s	③ Def. of $\perp$
④ $\angle X \cong \angle Y$	④ Rt. $\angle$s Thm
⑤ $\angle N \cong \angle T$, $\overline{LN} \cong \overline{RT}$	⑤ CPCTC
⑥ $\triangle LXN \cong \triangle RYT$	⑥ AAS $\cong$ Thm
⑦ $\overline{LX} \cong \overline{RY}$	⑦ CPCTC

A#36 Continued

Key

$\boxed{P+II}$ p. 157 WE #21–23

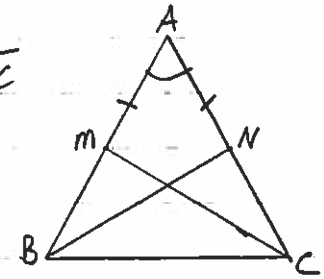


21. Given: $\overline{AB} \cong \overline{AC}$; $\overline{BD} \perp \overline{AC}$; $\overline{CE} \perp \overline{AB}$

Prove: $\overline{BD} \cong \overline{CE}$

Statements	Reasons
① $\overline{AB} \cong \overline{AC}$; $\overline{BD} \perp \overline{AC}$; $\overline{CE} \perp \overline{AB}$	① Given
② $\angle ADB$ and $\angle AEC$ are Rt $\angle$s	② Def. of $\perp$
③ $\angle ADB \cong \angle AEC$	③ Rt. $\angle$s Thm
④ $\angle A \cong \angle A$	④ Refl Prop. of $\cong$
⑤ $\triangle ABD \cong \triangle ACE$	⑤ AAS $\cong$ Thm
⑥ $\overline{BD} \cong \overline{CE}$	⑥ CPCTC

* thrm: The altitudes drawn to the legs of an isosceles $\triangle$ are $\cong$.

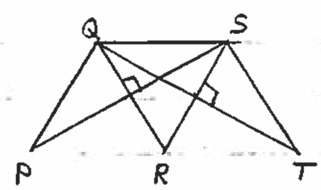


22. Given: $\overline{AB} \cong \overline{AC}$; M is the midpt of $\overline{AB}$; N is the midpt of $\overline{AC}$

Prove: $\overline{BN} \cong \overline{CM}$

Statements	Reasons
① $\overline{AB} \cong \overline{AC}$; M is the midpt of $\overline{AB}$; N is the midpt of $\overline{AC}$	① Given
② $AB = AC$	② Def. of $\cong$ seg
③ $AM = \frac{1}{2}AB$; $AN = \frac{1}{2}AC$	③ midpt Thrm
④ $AM = \frac{1}{2}AC$	④ Subst. Prop. of = $(2 \to 3)$
⑤ $\overline{AM} \cong \overline{AN}$	⑤ Def. of $\cong$ Seg.
⑥ $\angle A \cong \angle A$	⑥ Refl. Prop. of $\cong$
⑦ $\triangle AMC \cong \triangle ANB$	⑦ SAS $\cong$ Post
⑧ $\overline{BN} \cong \overline{CM}$	⑧ CPCTC

*Thrm: The medians drawn to the legs of an isosceles $\triangle$ are $\cong$.



23. Given: $\overleftrightarrow{SR}$ is the $\perp$ bisector of $\overline{QT}$;
$\overleftrightarrow{QR}$ is the $\perp$ bisector of $\overline{SP}$.

Prove: $PQ = TS$

Statements	Reasons
① $\overleftrightarrow{SR}$ is the $\perp$ bisector of $\overline{QT}$; $\overleftrightarrow{QR}$ is the $\perp$ bisector of $\overline{SP}$.	① Given
② $PQ = SQ$; $SQ = TS$	② $\perp$ bisector thrm
③ $PQ = TS$	③ Trans. Prop. of =