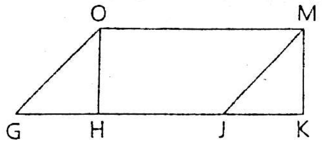
2 Given: GJMO is a ▱
$\overline{OH} \perp \overline{GK}$
$\overline{MK}$ is an altitude of $\triangle MKJ$

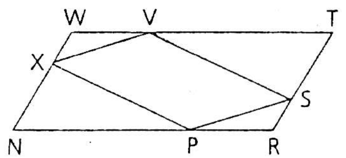
Prove: OHKM is a rectangle



1 GJMO is a ▱	1 Given
2 $\overleftrightarrow{OM} \parallel \overleftrightarrow{GK}$	2 The opposite sides of a ▱ are ∥
3 $\overline{OH} \perp \overline{GK}$	3 Given
4 $\overline{MK}$ is alt. of $\triangle$ MKJ	4 Given
5 $\overline{MK} \perp \overline{GK}$	5 An altitude of a $\triangle$ is $\perp$ to the side to which it is drawn
6 $\overline{OH} \parallel \overline{MK}$	6 In a plane, if two lines are $\perp$ to a third line, they are ∥ to each other
7 OHKM is a ▱	7 If both pairs of opposite sides are ∥, then a quadrilateral is a ▱
8 ∠OHK is a right ∠	8 $\perp$ segments form a right ∠
9 OHKM is a rectangle	9 If a ▱ contains at least one right angle, it is a rectangle

3 Given: NRTW is a ▱
$\overline{NX} \cong \overline{TS}$
$\overline{WV} \cong \overline{PR}$

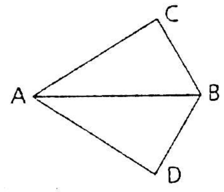
Prove: XPSV is a ▱



1 NRTW is a ▱	1 Given
2 ∠N ≅ ∠T	2 The opposite ∠s of a ▱ are ≅
3 $\overline{NX} \cong \overline{TS}$	3 Given
4 $\overline{NR} \cong \overline{WT}$	4 The opposite sides of a ▱ are ≅
5 $\overline{WV} \cong \overline{PR}$	5 Given
6 $\overline{NP} \cong \overline{VT}$	6 Subtraction Property
7 $\triangle NXP \cong \triangle TSV$	7 SAS (3, 2, 6)
8 $\overline{XP} \cong \overline{VS}$	8 CPCTC
9 In a similar manner, $\triangle WXV \cong \triangle RSP$, $\overline{XV} \cong \overline{PS}$	9 Steps 1–8
10 XPSV is a ▱	10 If both pairs of opposite sides are ≅, a quadrilateral is a ▱

2 Given: $\overline{BC} \perp \overline{AC}$
$\overline{BD} \perp \overline{AD}$
$\overline{AC} \cong \overline{AD}$

Prove: $\overrightarrow{AB}$ bisects ∠CAD



Statements	Reasons
1 $\overline{BC} \perp \overline{AC}$	1 Given
2 ∠ACB is a right ∠	2 If two segments are $\perp$, they form right ∠s
3 $\overline{BD} \perp \overline{AD}$	3 Given
4 ∠BDA is a right ∠	4 Same as 2
5 $\overline{AC} \cong \overline{AD}$	5 Given
6 $\overline{AB} \cong \overline{AB}$	6 Reflexive Property
7 $\triangle ACB \cong \triangle ADB$	7 HL (2, 4, 6, 5)
8 ∠CAB ≅ ∠DAB	8 CPCTC
9 $\overrightarrow{AB}$ bisects ∠CAD	9 A ray that divides an ∠ into two ≅ angles bisects the ∠

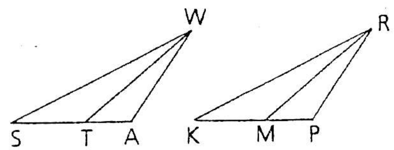
3 Prove: Corresponding angle bisectors of ≅ triangles are ≅.

Note: Offhand, it looks like a two step proof using CPCTC. Not so! *Corresponding Parts* refers only to sides and angles of the ≅ △s.

Again, we must make up our own figure and set up the proof.

Given: $\triangle KPR \cong \triangle SAW$
$\overrightarrow{RM}$ bisects ∠KRP
$\overrightarrow{WT}$ bisects ∠SWA

Prove: $\overline{RM} \cong \overline{WT}$

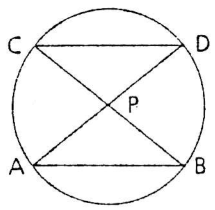


Statements	Reasons
1 $\triangle KPR \cong \triangle SAW$	1 Given
2 $\overline{KR} \cong \overline{SW}$	2 CPCTC
3 ∠K ≅ ∠S	3 CPCTC
4 ∠KRP ≅ ∠SWA	4 CPCTC
5 $\overrightarrow{RM}$ bisects ∠KRP	5 Given
6 $\overrightarrow{WT}$ bisects ∠SWA	6 Given
7 ∠KRM ≅ ∠SWT	7 Division Property
8 $\triangle KRM \cong \triangle SWT$	8 ASA (3, 2, 7)
9 $\overline{RM} \cong \overline{WT}$	9 CPCTC

Section 3.2 Sample Problems

1 Given: ⊙ P

Conclusion: $\overline{AB} \cong \overline{CD}$



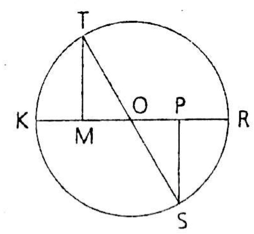
Statements	Reasons
1 ⊙ P	1 Given
2 $\overline{PA} \cong \overline{PB} \cong \overline{PC} \cong \overline{PD}$	2 All radii of a circle are ≅
3 ∠CPD ≅ ∠APB	3 Vertical angles are congruent
4 △CPD ≅ △APB	4 SAS (2, 3, 2)
5 $\overline{AB} \cong \overline{CD}$	5 CPCTC (Corresponding parts of congruent triangles are congruent)

2 Given: ⊙ O

∠T is comp. to ∠MOT

∠S is comp. to ∠POS

Prove: $\overline{MO} \cong \overline{PO}$



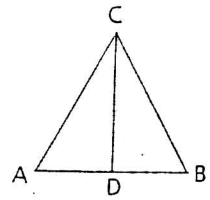
Statements	Reasons
1 ⊙ O	1 Given
2 $\overline{OT} \cong \overline{OS}$	2 All radii of a circle are ≅
3 ∠T is comp. to ∠MOT	3 Given
4 ∠S is comp. to ∠POS	4 Given
5 ∠MOT ≅ ∠POS	5 Vertical angles are congruent
6 ∠T ≅ ∠S	6 Complements of ≅ ∠s are ≅
7 △MOT ≅ △POS (watch the correspondence)	7 ASA (5, 2, 6)
8 $\overline{MO} \cong \overline{PO}$	8 CPCTC

Section 3.3 Sample Problems

1 Given: $\overline{AC} \cong \overline{BC}$

$\overline{AD} \cong \overline{BD}$

Prove: $\overrightarrow{CD}$ bisects ∠ACB

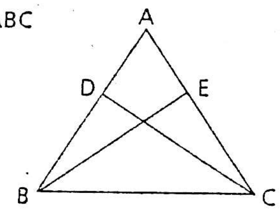


Statements	Reasons
1 $\overline{AC} \cong \overline{BC}$	1 Given
2 $\overline{AD} \cong \overline{BD}$	2 Given
3 $\overline{CD} \cong \overline{CD}$	3 Reflexive Property
4 △ACD ≅ △BCD	4 SSS (1, 2, 3)
5 ∠ACD ≅ ∠BCD	5 CPCTC
6 $\overrightarrow{CD}$ bisects ∠ACB	6 If a ray divides an angle into two ≅ angles, the ray bisects the angle

2 Given: $\overline{CD}$ and $\overline{BE}$ are altitudes of △ABC

$\overline{AD} \cong \overline{AE}$

Prove: $\overline{DB} \cong \overline{EC}$



Statements	Reasons
1 $\overline{CD}$ and $\overline{BE}$ are altitudes of △ABC	1 Given
2 ∠ADC is a right ∠	2 An altitude of a △ forms right ∠s with the side to which it is drawn
3 ∠AEB is a right ∠	3 Same as 2
4 ∠ADC ≅ ∠AEB	4 If ∠s are right ∠s, they are ≅
5 ∠A ≅ ∠A	5 Reflexive
6 $\overline{AD} \cong \overline{AE}$	6 Given
7 △ADC ≅ △AEB	7 ASA (4, 6, 5)
8 $\overline{AB} \cong \overline{AC}$	8 CPCTC
9 $\overline{DB} \cong \overline{EC}$	9 Subtraction Property (6 from 8)