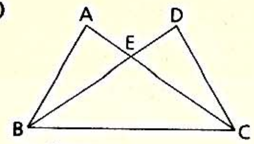
Pages 139–141 (Section 3.5)

1 Given: $\overline{AB} \cong \overline{DC}$

$\overline{AC} \cong \overline{DB}$

Prove: $\triangle ABC \cong \triangle DCB$



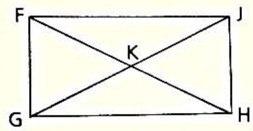
1 $\overline{AB} \cong \overline{DC}, \overline{AC} \cong \overline{DB}$	1 Given
2 $\overline{BC} \cong \overline{BC}$	2 Reflexive prop
3 $\triangle ABC \cong \triangle DCB$	3 SSS

2 Given: $\angle FGH$ is a rt $\angle$.

$\angle JHG$ is a rt $\angle$.

$\overline{FG} \cong \overline{JH}$

Prove: $\triangle FGH \cong \triangle JHG$

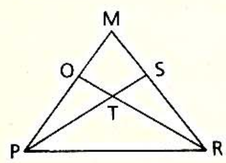


1 $\angle FGH$ is a rt $\angle$.	1 Given
2 $\angle JHG$ is a rt $\angle$.	2 Given
3 $\angle FGH \cong \angle JHG$	3 Rt $\angle$s are $\cong$.
4 $\overline{FG} \cong \overline{JH}$	4 Given
5 $\overline{GH} \cong \overline{GH}$	5 Reflexive prop
6 $\triangle FGH \cong \triangle JHG$	6 SAS

3 Given: $\overline{PM} \cong \overline{RM}$

$\angle SPM \cong \angle ORM$

Prove: $\triangle PSM \cong \triangle ROM$

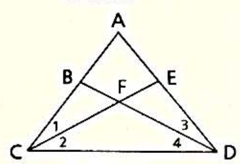


1 $\overline{PM} \cong \overline{RM}$	1 Given
2 $\angle SPM \cong \angle ORM$	2 Given
3 $\angle M \cong \angle M$	3 Reflexive prop
4 $\triangle PSM \cong \triangle ROM$	4 ASA

4 Given: $\angle 1 \cong \angle 3$

$\angle 2 \cong \angle 4$

Concl: $\overline{BC} \cong \overline{ED}$



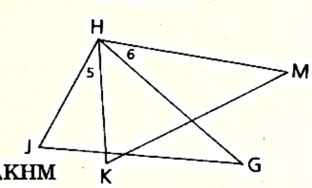
1 $\angle 1 \cong \angle 3, \angle 2 \cong \angle 4$	1 Given
2 $\overline{CD} \cong \overline{CD}$	2 Reflexive prop
3 $\angle BCD \cong \angle EDC$	3 Addition prop
4 $\triangle BCD \cong \triangle EDC$	4 ASA
5 $\overline{BC} \cong \overline{ED}$	5 CPCTC

5 Given: $\overline{JH} \cong \overline{KH}$

$\overline{HG} \cong \overline{HM}$

$\angle 5 \cong \angle 6$

Concl: $\triangle JHG \cong \triangle KHM$



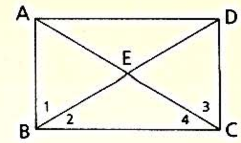
1 $\overline{JH} \cong \overline{KH}, \overline{HG} \cong \overline{HM}$	1 Given
2 $\angle 5 \cong \angle 6$	2 Given
3 $\angle GHK \cong \angle GHK$	3 Reflexive prop
4 $\angle JHG \cong \angle KHM$	4 Addition prop
5 $\triangle JHG \cong \triangle KHM$	5 SAS

6 Given: $\angle 1$ is comp to $\angle 2$.

$\angle 3$ is comp to $\angle 4$.

$\angle 1 \cong \angle 3$

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



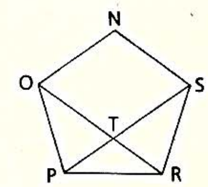
1 $\angle 1$ is comp to $\angle 2$.	1 Given
2 $\angle 3$ is comp to $\angle 4$.	2 Given
3 $\angle 1 \cong \angle 3$	3 Given
4 $\angle 2 \cong \angle 4$	4 Comps of $\cong$ $\angle$s are $\cong$.
5 $\angle ABC \cong \angle DCB$	5 Addition prop
6 $\overline{BC} \cong \overline{BC}$	6 Reflexive prop
7 $\triangle ABC \cong \triangle DCB$	7 ASA
8 $\overline{AB} \cong \overline{CD}$	8 CPCTC

7 Given: Figure NOPRS is equilateral.

$\angle OPR \cong \angle PRS$

$\overline{PT} \cong \overline{TR}$

Prove: $\overline{OT} \cong \overline{ST}$

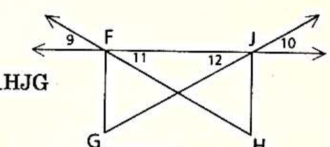


1 NOPRS is equilateral.	1 Given
2 $\angle OPR \cong \angle PRS$	2 Given
3 $\overline{OP} \cong \overline{SR}$	3 All sides are $\cong$.
4 $\overline{PR} \cong \overline{PR}$	4 Reflexive prop
5 $\triangle OPR \cong \triangle SRP$	5 SAS
6 $\overline{OR} \cong \overline{SP}$	6 CPCTC
7 $\overline{PT} \cong \overline{TR}$	7 Given
8 $\overline{OT} \cong \overline{ST}$	8 Subtraction prop

8 Given: $\angle 9 \cong \angle 10$

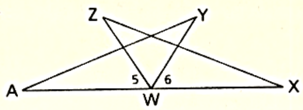
$\angle GFH \cong \angle HJG$

Concl: $\overline{FG} \cong \overline{JH}$



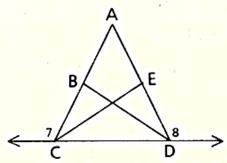
1 $\angle 9 \cong \angle 10$	1 Given
2 $\angle 9 \cong \angle 11, \angle 10 \cong \angle 12$	2 Vert $\angle$s are $\cong$.
3 $\angle 11 \cong \angle 12$	3 Transitive prop
4 $\angle GFH \cong \angle HJG$	4 Given
5 $\angle GFJ \cong \angle HJF$	5 Addition prop
6 $\overline{FJ} \cong \overline{FJ}$	6 Reflexive prop
7 $\triangle GFJ \cong \triangle HJF$	7 ASA
8 $\overline{FG} \cong \overline{JH}$	8 CPCTC

9 Given: $\overline{YW}$ bis $\overline{AX}$.
∠A ≅ ∠X
∠5 ≅ ∠6
Concl: $\overline{ZW}$ ≅ $\overline{YW}$



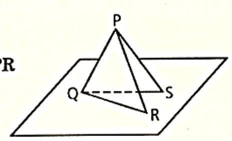
1 $\overline{YW}$ bis $\overline{AX}$.	1 Given
2 $\overline{AW}$ ≅ $\overline{WX}$	2 A bis divides a seg into 2 ≅ segs.
3 ∠A ≅ ∠X, ∠5 ≅ ∠6	3 Given
4 ∠ZWY ≅ ∠ZWY	4 Reflexive prop
5 ∠AWY ≅ ∠XWZ	5 Addition prop
6 △ZWX ≅ △YWA	6 ASA
7 $\overline{ZW}$ ≅ $\overline{YW}$	7 CPCTC

10 Given: B mdpt of $\overline{AC}$
E mdpt of $\overline{AD}$
∠7 ≅ ∠8
∠ECD ≅ ∠BDC
Prove: $\overline{AC}$ ≅ $\overline{AD}$



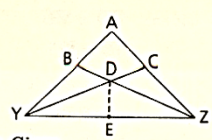
1 B mdpt of $\overline{AC}$	1 Given
2 E mdpt of $\overline{AD}$	2 Given
3 ∠7 ≅ ∠8	3 Given
4 ∠ECD ≅ ∠BDC	4 Given
5 ∠7 supp to ∠BCD	5 If 2 ∠s form a st ∠, they are supp.
6 ∠8 supp to ∠EDC	6 Same as 5
7 ∠BCD ≅ ∠EDC	7 Supp of ≅ ∠s are ≅.
8 $\overline{CD}$ ≅ $\overline{CD}$	8 Reflexive prop
9 △BDC ≅ △ECD	9 ASA
10 $\overline{BC}$ ≅ $\overline{ED}$	10 CPCTC
11 $\overline{AC}$ ≅ $\overline{AD}$	11 Multiplication prop

11 Given: $\overline{PS}$ ≅ $\overline{PR}$
∠QPS ≅ ∠QPR
Prove: $\overline{QR}$ ≅ $\overline{QS}$



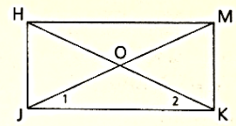
1 $\overline{PS}$ ≅ $\overline{PR}$	1 Given
2 ∠QPS ≅ ∠QPR	2 Given
3 $\overline{QP}$ ≅ $\overline{QP}$	3 Reflexive prop
4 △QPR ≅ △QPS	4 SAS
5 $\overline{QR}$ ≅ $\overline{QS}$	5 CPCTC

14 Given: $\overline{YD}$ ≅ $\overline{ZD}$
$\overline{BD}$ ≅ $\overline{CD}$
E mdpt of $\overline{YZ}$
Concl: ∠BYZ ≅ ∠CZY



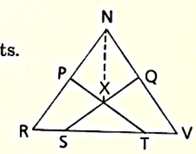
1 $\overline{YD}$ ≅ $\overline{ZD}$, $\overline{BD}$ ≅ $\overline{CD}$	1 Given
2 ∠BDY ≅ ∠CDZ	2 Vert ∠s are ≅.
3 △BDY ≅ △CDZ	3 SAS
4 E mdpt of $\overline{YZ}$	4 Given
5 $\overline{YE}$ ≅ $\overline{EZ}$	5 A mdpt divides a seg into 2 ≅ segs.
6 Draw $\overline{DE}$	6 Two pts determine a line.
7 $\overline{DE}$ ≅ $\overline{DE}$	7 Reflexive prop
8 △DYE ≅ △DZE	8 SSS
9 ∠BYD ≅ ∠CZD	9 CPCTC
10 ∠DYE ≅ ∠DZE	10 CPCTC
11 ∠BYZ ≅ ∠CZY	11 Addition prop

12 Given: $\overline{HO}$ ≅ $\overline{MO}$
$\overline{JO}$ ≅ $\overline{KO}$
$\overline{HJ}$ is an alt of △HJK.
$\overline{MK}$ is an alt of △MKJ.
Prove: ∠1 ≅ ∠2



1 $\overline{HO}$ ≅ $\overline{MO}$, $\overline{JO}$ ≅ $\overline{KO}$	1 Given
2 ∠HOJ ≅ ∠MOK	2 Vert ∠s are ≅.
3 △HOJ ≅ △MOK	3 SAS
4 $\overline{HJ}$ is an alt of △HJK.	4 Given
5 ∠HJK is a rt ∠.	5 An alt of a △ forms rt ∠s with one of the sides.
6 $\overline{MK}$ is an alt of △MKJ.	6 Given
7 ∠MKJ is a rt ∠.	7 Given
8 ∠HJK ≅ ∠MKJ	8 Rt ∠s are ≅.
9 ∠HJO ≅ ∠MKO	9 CPCTC
10 ∠1 ≅ ∠2	10 Subtraction prop

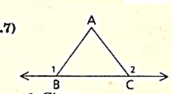
13 Given: $\overline{NR}$ ≅ $\overline{NV}$
P and Q are mdpts.
∠R ≅ ∠V
$\overline{PX}$ ≅ $\overline{QX}$
Prove: △XST is isos.



1 $\overline{NR}$ ≅ $\overline{NV}$	1 Given
2 P and Q are mdpts.	2 Given
3 $\overline{NP}$ ≅ $\overline{NQ}$, $\overline{PR}$ ≅ $\overline{QV}$	3 Division prop
4 ∠R ≅ ∠V	4 Given
5 $\overline{PX}$ ≅ $\overline{QX}$	5 Given
6 Draw $\overline{NX}$	6 Two pts determine a line.
7 $\overline{NX}$ ≅ $\overline{NX}$	7 Reflexive prop
8 △NPX ≅ △NQX	8 SSS
9 ∠NPX ≅ ∠NQX	9 CPCTC
10 ∠RPT supp of ∠NPX	10 If 2 ∠s form a st ∠, they are supp.
11 ∠VQS supp of ∠NQX	11 Same as 10
12 ∠RPT ≅ ∠VQS	12 Supps of ≅ ∠s are ≅.
13 △RPT ≅ △VQS	13 ASA
14 $\overline{QS}$ ≅ $\overline{PT}$	14 CPCTC
15 $\overline{XS}$ ≅ $\overline{XT}$	15 Subtraction prop
16 △XST is isos.	16 An isos △ is a △ with at least 2 sides ≅.

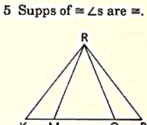
Pages 152–155 (Section 3.7)

1 Given: $\overline{AB}$ ≅ $\overline{AC}$
Concl: ∠1 ≅ ∠2



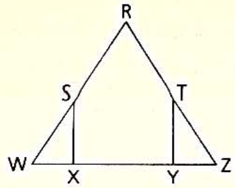
1 $\overline{AB}$ ≅ $\overline{AC}$	1 Given
2 ∠ABC ≅ ∠ACB	2 If △ then △
3 ∠1 supp to ∠ABC	3 If 2 ∠s form a st ∠, they are supp.
4 ∠2 supp to ∠ACB	4 Same as 3
5 ∠1 ≅ ∠2	5 Supps of ≅ ∠s are ≅.

2 Given: ∠KRM ≅ ∠PRO
$\overline{KR}$ ≅ $\overline{PR}$
Prove: $\overline{RM}$ ≅ $\overline{RO}$



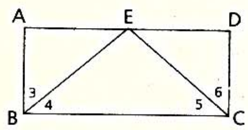
1 ∠KRM ≅ ∠PRO	1 Given
2 $\overline{KR}$ ≅ $\overline{PR}$	2 Given
3 ∠RKM ≅ ∠RPO	3 If △ then △
4 △KRM ≅ △PRO	4 ASA
5 $\overline{RM}$ ≅ $\overline{RO}$	5 CPCTC

3 Given: $\overline{SX} \cong \overline{TY}$
$\overline{WX} \cong \overline{YZ}$
$\overline{SW} \cong \overline{TZ}$
Prove: $\overline{RW} \cong \overline{RZ}$



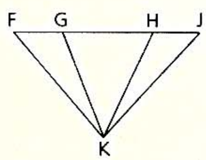
1 $\overline{SX} \cong \overline{TY}$	1 Given
2 $\overline{WX} \cong \overline{YZ}$	2 Given
3 $\overline{SW} \cong \overline{TZ}$	3 Given
4 $\triangle SWX \cong \triangle TZY$	4 SSS
5 $\angle RWX \cong \angle RZY$	5 CPCTC
6 $\overline{RW} \cong \overline{RZ}$	6 If $\triangle$ then $\triangle$

4 Given: $\angle 3 \cong \angle 6$
$\angle 3$ comp to $\angle 4$
$\angle 6$ comp to $\angle 5$
Prove: $\triangle EBC$ is isos.



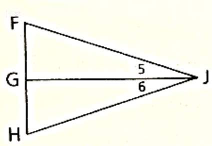
1 $\angle 3 \cong \angle 6$	1 Given
2 $\angle 3$ comp to $\angle 4$	2 Given
3 $\angle 6$ comp to $\angle 5$	3 Given
4 $\angle 4 \cong \angle 5$	4 Comps of $\cong \angle$s are $\cong$.
5 $\overline{EB} \cong \overline{EC}$	5 If $\triangle$ then $\triangle$
6 $\triangle EBC$ is isos.	6 If at least 2 sides of a $\triangle$ are $\cong$, the $\triangle$ is isos.

5 Given: $\overline{FH} \cong \overline{GJ}$
$\triangle FKJ$ is isos
with $\overline{FK} \cong \overline{JK}$.
Prove: $\triangle FKH \cong \triangle JKG$



1 $\overline{FH} \cong \overline{GJ}$	1 Given
2 $\triangle FKG$ is isos, $\overline{FK} \cong \overline{JK}$	2 Given
3 $\angle GFK \cong \angle HJK$	3 If $\triangle$ then $\triangle$
4 $\triangle FKH \cong \triangle JKG$	4 SAS

6 Given: $\angle 5 \cong \angle 6$
$\overline{JG}$ is alt to $\overline{FH}$.
Prove: $\triangle FJH$ is isos.



1 $\angle 5 \cong \angle 6$	1 Given
2 $\overline{JG}$ is alt to $\overline{FH}$.	2 Given
3 $\angle JGF$ and $\angle JGH$ are rt $\angle$s.	3 An alt of a $\triangle$ forms rt $\angle$s with one of the sides.
4 $\angle JGF \cong \angle JGH$	4 Rt $\angle$s are $\cong$.
5 $\overline{JG} \cong \overline{JG}$	5 Reflexive prop
6 $\triangle FJG \cong \triangle HJG$	6 ASA
7 $\overline{FJ} \cong \overline{HJ}$	7 CPCTC
8 $\triangle FJH$ is isos.	8 If at least 2 sides of a $\triangle$ are $\cong$, the $\triangle$ is isos.

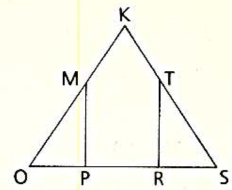
7 $\angle B, \angle A, \angle C$

8 $m\angle R < m\angle P$ and $m\angle R + m\angle P < 180$

$4x < 7x - 18$	$4x + 7x - 18 < 180$
$18 < 3x$	$11x < 198$
$6 < x$	$x < 18$

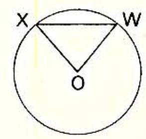
$\therefore 6 < x < 18$

9 Given: $\overline{OP} \cong \overline{RS}$
$\overline{KO} \cong \overline{KS}$
M mdpt of $\overline{OK}$
T mdpt of $\overline{KS}$
Prove: $\overline{MP} \cong \overline{TR}$



1 $\overline{OP} \cong \overline{RS}$	1 Given
2 $\overline{KO} \cong \overline{KS}$	2 Given
3 M mdpt of $\overline{OK}$	3 Given
4 T mdpt of $\overline{KS}$	4 Given
5 $\overline{MO} \cong \overline{TS}$	5 Division prop
6 $\angle O \cong \angle S$	6 If $\triangle$ then $\triangle$
7 $\triangle MOP \cong \triangle TSR$	7 SAS
8 $\overline{MP} \cong \overline{TR}$	8 CPCTC

10 Given: $\odot O$
$\overline{OX} \cong \overline{XW}$
Prove: $\triangle XOW$ is equilateral.



1 $\odot O$	1 Given
2 $\overline{XO} \cong \overline{WO}$	2 Radii of a $\odot$ are $\cong$.
3 $\overline{OX} \cong \overline{XW}$	3 Given
4 $\overline{WO} \cong \overline{XW}$	4 Transitive prop
5 $\triangle XOW$ is equilateral.	5 An equilateral $\triangle$ is one in which all sides are $\cong$.

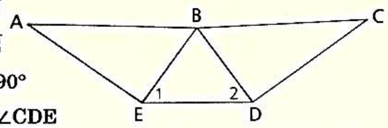
11 $\angle ACB$ is 90° because $\overline{AC} \perp \overline{BC}$.

$3x = 90$	$BC = x + 20$	$AC = 2x - 20$,
$x = 30$	$BC = 30 + 20 = 50$	$AC = 2(30) - 20 = 40$

No, $\triangle ABC$ is not isos because no sides are $\cong$.
(AB > either leg)

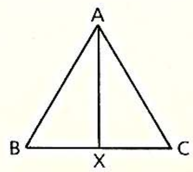
12 **a** Since $\overline{QS}$ and $\overline{QP}$ are both radii of $\odot Q$, $\overline{QS} \cong \overline{QP}$.
$m\angle PSQ = m\angle P = 36°$
b $\angle PSR$ is rt $\angle$, so $m\angle R = 180° - 90° - 36° = 54°$

13 Given: $\overline{BE} \cong \overline{BD}$
$\overline{BE} \perp \overline{AE}$
$\angle BDC = 90°$
Prove: $\angle AED \cong \angle CDE$



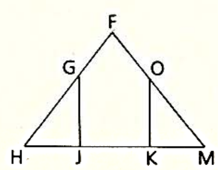
1 $\overline{BE} \cong \overline{BD}$	1 Given
2 $\angle 1 \cong \angle 2$	2 If $\triangle$ then $\triangle$
3 $\overline{BE} \perp \overline{AE}$	3 Given
4 $\angle BEA$ is a rt $\angle$.	4 If 2 segs are $\perp$, they form rt $\angle$s.
5 $\angle BDC = 90°$	5 Given
6 $\angle BDC$ is a rt $\angle$.	6 A rt $\angle$ is an $\angle$ of 90°.
7 $\angle BEA \cong \angle BDC$	7 Rt $\angle$s are $\cong$.
8 $\angle AED \cong \angle CDE$	8 Addition prop

14 Given: $\triangle ABC$ is isos with $\overline{AB} \cong \overline{AC}$. $\overline{AX}$ is median to $\overline{BC}$.
Prove: $\overrightarrow{AX}$ bis $\angle BAC$.



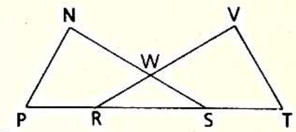
1 $\triangle ABC$ is isos, $\overline{AB} \cong \overline{AC}$.	1 Given
2 $\angle B \cong \angle C$	2 If $\triangle$ then $\triangle$
3 $\overline{AX}$ is median to $\overline{BC}$.	3 Given
4 $\overline{BX} \cong \overline{XC}$	4 A median of a $\triangle$ divides one side into 2 $\cong$ segs.
5 $\triangle ABX \cong \triangle ACX$	5 SAS
6 $\angle BAX \cong \angle CAX$	6 CPCTC
7 $\overrightarrow{AX}$ bis $\angle BAC$.	7 If a ray divides an $\angle$ into 2 $\cong$ $\angle$s, it bis the $\angle$.

15 Given: $\overline{HK} \cong \overline{JM}$
$\overline{GJ} \cong \overline{JK}$
$\overline{OK} \cong \overline{JK}$
$\overline{GJ}$ and $\overline{OK}$ are $\perp$ to $\overline{HM}$.
Prove: $\triangle FHM$ is isos.



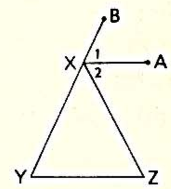
1 $\overline{HK} \cong \overline{JM}$	1 Given
2 $\overline{JK} \cong \overline{JK}$	2 Reflexive prop
3 $\overline{HJ} \cong \overline{KM}$	3 Subtraction prop
4 $\overline{GJ} \cong \overline{JK}$	4 Given
5 $\overline{OK} \cong \overline{JK}$	5 Given
6 $\overline{GJ} \cong \overline{OK}$	6 Transitive prop
7 $\overline{GJ}$ and $\overline{OK} \perp \overline{HM}$	7 Given
8 $\angle GJH$ and $\angle OKM$ are rt $\angle$s.	8 If 2 segs are $\perp$, they form rt $\angle$s.
9 $\angle GJH \cong \angle OKM$	9 Rt $\angle$s are $\cong$.
10 $\triangle GJH \cong \triangle OMK$	10 SAS
11 $\angle H \cong \angle M$	11 CPCTC
12 $\overline{HF} \cong \overline{MF}$	12 If $\triangle$ then $\triangle$
13 $\triangle FHM$ is isos.	13 If a $\triangle$ has 2 $\cong$ sides, it is isos.

16 Given: $\overline{PR} \cong \overline{ST}$
$\overline{NP} \cong \overline{VT}$
$\angle P \cong \angle T$
Prove: $\triangle WRS$ is isos.



1 $\overline{PR} \cong \overline{ST}$	1 Given
2 $\overline{RS} \cong \overline{RS}$	2 Reflexive prop
3 $\overline{PS} \cong \overline{RT}$	3 Addition prop
4 $\overline{NP} \cong \overline{VT}$	4 Given
5 $\angle P \cong \angle T$	5 Given
6 $\triangle NPS \cong \triangle VTR$	6 SAS
7 $\angle S \cong \angle R$	7 CPCTC
8 $\overline{RW} \cong \overline{SW}$	8 If $\triangle$ then $\triangle$
9 $\triangle WRS$ is isos.	9 If a $\triangle$ has 2 $\cong$ sides, it is isos.

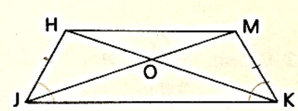
17 Given: $\overline{YZ}$ is base of an isos $\triangle$.
$\angle 2 \cong \angle Z$
$\angle 1 \cong \angle Y$
Prove: $\overrightarrow{XA}$ bis $\angle BXZ$.



1 $\overline{YZ}$ base of isos $\triangle$.	1 Given
2 $\angle 2 \cong \angle Z$, $\angle 1 \cong \angle Y$	2 Given
3 $\overline{XY} \cong \overline{XZ}$	3 An isos $\triangle$ is a $\triangle$ in which at least 2 sides are $\cong$.
4 $\angle Y \cong \angle Z$	4 If $\triangle$ then $\triangle$
5 $\angle 1 \cong \angle 2$	5 Transitive prop
6 $\overrightarrow{XA}$ bis $\angle BXZ$.	6 If a ray divides an $\angle$ into 2 $\cong$ $\angle$s, it bis the $\angle$.

18 The base of the pyramid is a square, and since all 4 sides of a square are $\cong$, the 4 bases of the isos $\triangle$s are $\cong$. Each $\triangle$ is isos. Since each $\triangle$ shares a side with 2 other $\triangle$s, all 4 legs involved must be $\cong$. Then all 4 $\triangle$s are $\cong$ by SSS.

19 Given: $\overline{HJ} \cong \overline{MK}$
$\angle HJK \cong \angle MKJ$
Concl: $\triangle JOK$ is isos.



1 $\overline{HJ} \cong \overline{MK}$	1 Given
2 $\angle HJK \cong \angle MKJ$	2 Given
3 $\overline{JK} \cong \overline{JK}$	3 Reflexive prop
4 $\triangle HJK \cong \triangle MKJ$	4 SAS
5 $\angle HKJ \cong \angle MJK$	5 CPCTC
6 $\overline{JO} \cong \overline{KO}$	6 If $\triangle$ then $\triangle$
7 $\triangle JOK$ is isos.	7 An isos $\triangle$ is a $\triangle$ in which at least 2 sides are $\cong$.

20 Since $\overline{AB} \cong \overline{AC}$, $\angle B \cong \angle C$ because if △ then △.

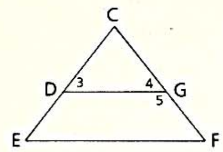
$$x + 6 = 2x - 54$$
$$60 = x$$
$$\angle B = 60 + 6 = 66, \angle C = 2(60) - 54 = 66$$
$$BC = \tfrac{1}{2}(66) = 33 \qquad AB = \tfrac{1}{3}(66) = 22$$

$\overline{AC} \cong \overline{AB}$ so $AC = 22$

Perimeter of $\triangle ABC$ = 77 cm

21 Given: $\overline{CE} \cong \overline{CF}$
$\angle F \cong \angle 3$
$\angle E$ supp to $\angle 5$

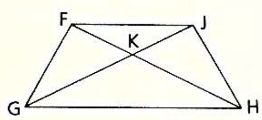
Prove: $\triangle CDG$ is isos.



1 $\overline{CE} \cong \overline{CF}$	1 Given
2 $\angle E \cong \angle F$	2 If △ then △
3 $\angle F \cong \angle 3$	3 Given
4 $\angle E \cong \angle 3$	4 Transitive prop
5 $\angle E$ supp $\angle 5$	5 Given
6 $\angle 4$ supp $\angle 5$	6 If 2 $\angle$s form a st $\angle$, they are supp.
7 $\angle E \cong \angle 4$	7 Supp of same $\angle$ are ≅.
8 $\angle 3 \cong \angle 4$	8 Transitive prop
9 $\overline{CD} \cong \overline{CG}$	9 If △ then △
10 $\triangle CDG$ is isos.	10 An isos △ is a △ in which at least 2 sides are ≅.

22 Given: $\overline{FG} \cong \overline{JH}$
$\angle FGH \cong \angle JHG$

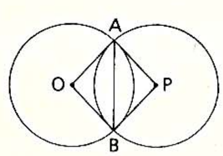
Concl: $\triangle FKJ$ is isos.



1 $\overline{FG} \cong \overline{JH}$	1 Given
2 $\angle FGH \cong \angle JHG$	2 Given
3 $\overline{GH} \cong \overline{GH}$	3 Reflexive prop
4 $\triangle FGH \cong \triangle JHG$	4 SAS
5 $\angle JGH \cong \angle FHG$	5 CPCTC
6 $\overline{GK} \cong \overline{KH}$	6 If △ then △
7 $\overline{JG} \cong \overline{FH}$	7 CPCTC
8 $\overline{FK} \cong \overline{KJ}$	8 Subtraction prop
9 $\triangle FKJ$ is isos.	9 An isos △ is a △ in which at least 2 sides are ≅.

23 Given: ⊙ O, ⊙ P
$\overleftrightarrow{AB}$ bis $\angle OAP$ and $\angle OBP$.

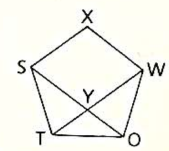
Prove: Figure AOBP is equilateral.



1 ⊙ O, ⊙ P	1 Given
2 $\overline{OA} \cong \overline{OB}$	2 Radii of a ⊙ are ≅.
3 $\overline{AP} \cong \overline{PB}$	3 Same as 2
4 $\angle OAB \cong \angle OBA$	4 If △ then △
5 $\angle PAB \cong \angle PBA$	5 If △ then △
6 $\overleftrightarrow{AB}$ bis $\angle OAP$ and $\angle OBP$.	6 Given
7 $\angle OAB \cong \angle PAB$, $\angle OBA \cong \angle PBA$	7 If a line bis an $\angle$, it divides the $\angle$ into 2 ≅ $\angle$s.
8 $\angle OBA \cong \angle PBA \cong \angle OAB \cong \angle PAB$	8 Transitive prop
9 $\overline{AB} \cong \overline{AB}$	9 Reflexive prop
10 $\triangle OAB \cong \triangle PAB$	10 ASA
11 $\overline{OA} \cong \overline{PA}$, $\overline{OB} \cong \overline{PB}$	11 CPCTC
12 $\overline{OA} \cong \overline{PA} \cong \overline{OB} \cong \overline{PB}$	12 Transitive prop
13 Figure AOBP is equilateral.	13 If all sides of a figure are ≅, the figure is equilateral.

24 Given: Figure XSTOW is equilateral and equiangular.

Prove: $\triangle YTO$ is isos.



1 XSTOW is equilateral and equiangular.	1 Given
2 $\overline{ST} \cong \overline{WO}$	2 If a figure is equilateral, all sides are ≅.
3 $\overline{TO} \cong \overline{TO}$	3 Reflexive prop
4 $\angle STO \cong \angle WOT$	4 If a figure is equiangular, all $\angle$s are ≅.
5 $\triangle STO \cong \triangle WOT$	5 SAS
6 $\angle YOT \cong \angle YTO$	6 CPCTC
7 $\overline{TY} \cong \overline{YO}$	7 If △ then △
8 $\triangle YTO$ is isos.	8 If a △ has at least 2 sides ≅, the △ is isos.

25 Since $\angle D \cong \angle F \cong \angle DEF$ and $\overline{GE} \perp \overline{DE}$,
$\angle FEG + \angle D = 90$ and $\angle FEG + \angle F = 90$.

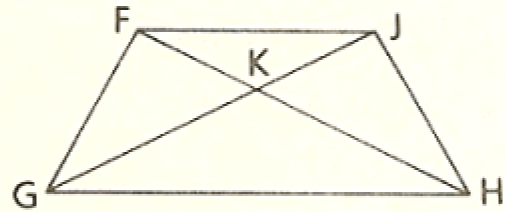
$$x + y + 3x - 6 = 90 \qquad x + y + 6y + 12 = 90$$
$$4x + y = 96 \qquad x + 7y = 78$$
$$4x = 96 - y$$
$$x = 24 - \tfrac{1}{4}y \quad \text{Substituting,}$$
$$(24 - \tfrac{1}{4}y) + 7y = 78$$
$$\tfrac{27}{4} = 54$$
$$y = 8$$

Then $x = 24 - \tfrac{1}{4}y$
$$x = 24 - \tfrac{1}{4}(8) = 22 \text{ and } \angle F = 6(8) + 12$$
$$x = 22, y = 8, \angle F = 60°$$

22 Given: $\overline{FG} \cong \overline{JH}$

$\angle FGH \cong \angle JHG$

Concl: $\triangle FKJ$ is isos.

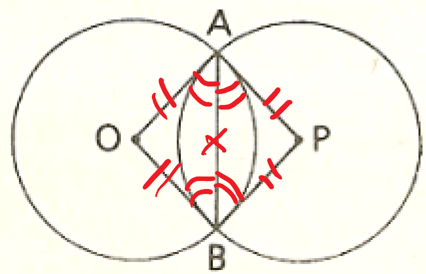


Statements	Reasons
1 $\overline{FG} \cong \overline{JH}$	1 Given
2 $\angle FGH \cong \angle JHG$	2 Given
3 $\overline{GH} \cong \overline{GH}$	3 Reflexive prop
4 $\triangle FGH \cong \triangle JHG$	4 SAS
5 $\angle JGH \cong \angle FHG$	5 CPCTC
6 $\overline{GK} \cong \overline{KH}$	6 If △ then △
7 $\overline{JG} \cong \overline{FH}$	7 CPCTC
8 $\overline{FK} \cong \overline{KJ}$	8 Subtraction prop
9 $\triangle FKJ$ is isos.	9 An isos $\triangle$ is a $\triangle$ in which at least 2 sides are $\cong$.

23 Given: ⊙ O, ⊙ P

$\overleftrightarrow{AB}$ bis ∠OAP and ∠OBP.

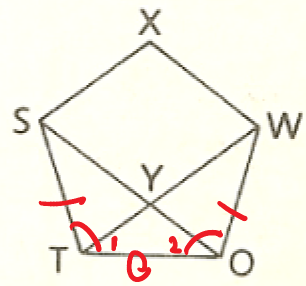
Prove: Figure AOBP is equilateral.

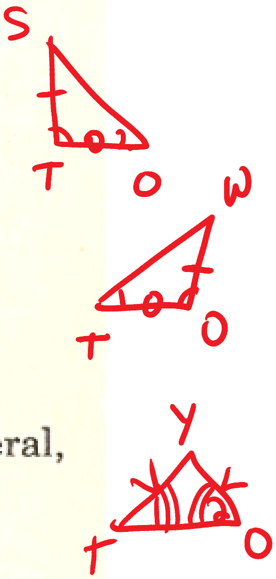


1 ⊙ O, ⊙ P	1 Given
2 $\overline{OA} \cong \overline{OB}$	2 Radii of a ⊙ are ≅.
3 $\overline{AP} \cong \overline{PB}$	3 Same as 2
4 ∠OAB ≅ ∠OBA	4 If △ then △
5 ∠PAB ≅ ∠PBA	5 If △ then △
6 $\overleftrightarrow{AB}$ bis ∠OAP and ∠OBP.	6 Given
7 ∠OAB ≅ ∠PAB, ∠OBA ≅ ∠PBA	7 If a line bis an ∠, it divides the ∠ into 2 ≅ ∠s.
8 ∠OBA ≅ ∠PBA ≅ ∠OAB ≅ ∠PAB	8 Transitive prop ✓
9 $\overline{AB} \cong \overline{AB}$	9 Reflexive prop
10 △OAB ≅ △PAB	10 ASA
11 $\overline{OA} \cong \overline{PA}$, $\overline{OB} \cong \overline{PB}$	11 CPCTC
12 $\overline{OA} \cong \overline{PA} \cong \overline{OB} \cong \overline{PB}$	12 Transitive prop
13 Figure AOBP is equilateral.	13 If all sides of a figure are ≅, the figure is equilateral.

24 Given: Figure XSTOW is equilateral and equiangular.

Prove: △YTO is isos.





Statements	Reasons
1 XSTOW is equilateral and equiangular.	1 Given
2 $\overline{ST} \cong \overline{WO}$	2 If a figure is equilateral, all sides are ≅.
3 $\overline{TO} \cong \overline{TO}$	3 Reflexive prop
4 ∠STO ≅ ∠WOT	4 If a figure is equiangular, all ∠s are ≅.
5 △STO ≅ △WOT	5 SAS
6 ∠YOT ≅ ∠YTO	6 CPCTC
7 $\overline{TY} \cong \overline{YO}$	7 If △ then △
8 △YTO is isos.	8 If a △ has at least 2 sides ≅, the △ is isos.

25 Since $\angle D \cong \angle F \cong \angle DEF$ and $\overline{GE} \perp \overline{DE}$,

$\angle FEG + \angle D = 90$ and $\angle FEG + \angle F = 90$.

$$x + y + 3x - 6 = 90 \qquad x + y + 6y + 12 = 90$$

$$4x + y = 96 \qquad x + 7y = 78$$

$$4x = 96 - y$$

$$x = 24 - \tfrac{1}{4}y \quad \text{Substituting,}$$

$$\left(24 - \tfrac{1}{4}y\right) + 7y = 78$$

$$\frac{27}{4} = 54$$

$$y = 8$$

Then $x = 24 - \frac{1}{4}y$

$$x = 24 - \tfrac{1}{4}(8) = 22 \text{ and } \angle F = 6(8) + 12$$

$$x = 22,\ y = 8,\ \angle F = 60°$$

25 Given: $\triangle FED$ is equilateral. → all ∠s & sds ≅

$\overline{GE} \perp \overline{DE}$, → 90°

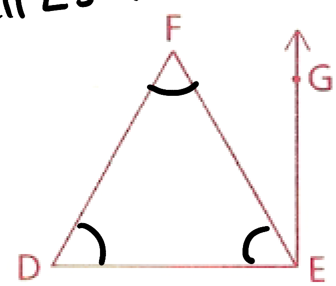
$m\angle FEG = x + y$,

$m\angle D = 3x - 6$,

$m\angle F = 6y + 12$

Find: x, y, and $\angle F$

60°



$\angle D = \angle F$

$3x - 6 = 6y + 12$

$3x - 6y = 18$

$x - 2y = 6$

$\angle DEF + \angle FEG = 90°$

$6y + 12 + x + y = 90$

$x + 7y = 78$

$x = -7y + 78$

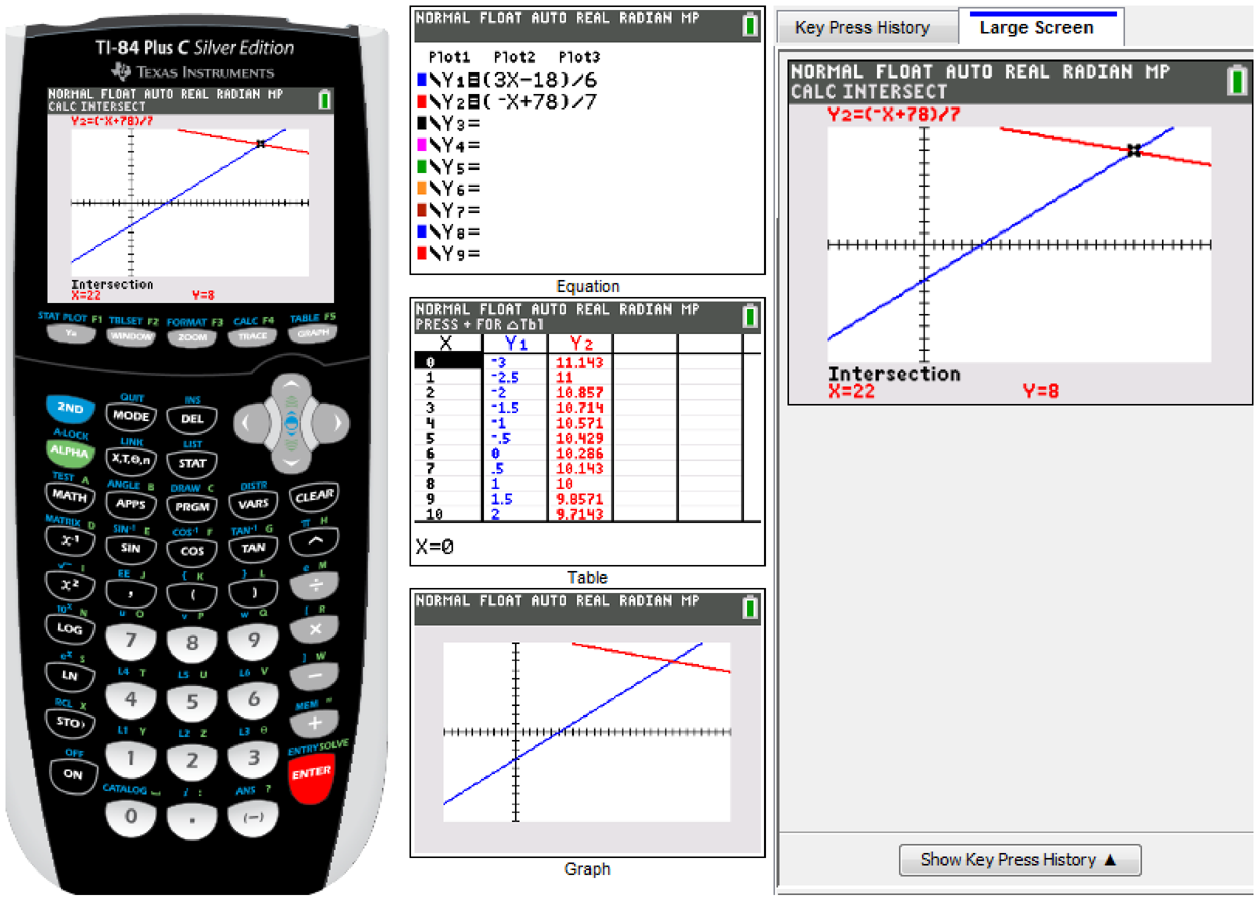
$-7y + 78 - 2y = 6$

$-9y = -72$

$y = 8$

$x = -56 + 78$

$x = 22$



$$3x - 6 = 6y + 12$$

$$3x - 18 = 6y$$

$$\frac{1}{6}(3x - 18) = y$$

$$(3x - 18)/6 = y_1$$

$$6y + 12 + x + y = 90$$

$$7y + x + 12 = 90$$

$$7y = -x + 78$$

$$y_2 = (-x + 78)/7$$