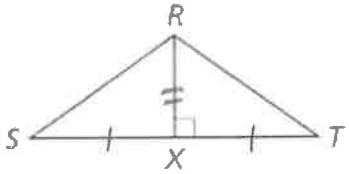
Name: KEY Hour: Date:

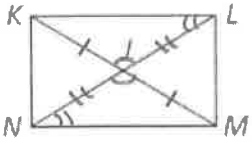
Advanced Geometry Practice – Proofs Involving Congruent Triangles and CPCTC

Given: X is the midpoint of $\overline{ST}$. $\overline{RX} \perp \overline{ST}$
Prove: $\overline{RS} \cong \overline{RT}$



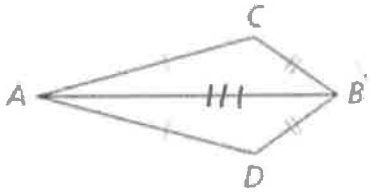
S	R
X mdpt of $\overline{ST}$	Given
$\overline{SX} \cong \overline{XT}$	Def. of mdpt
$\overline{RX} \perp \overline{ST}$	Given
$\angle RXS$ + $\angle RXT$ Right $\angle$'s	Def. of $\perp$
$\angle RXS \cong \angle RXT$	Rt $\angle \cong$ Thm
$\overline{RX} \cong \overline{RX}$	Reflexive
$\triangle RXS \cong \triangle RXT$	SAS
$\overline{RS} \cong \overline{RT}$	CPCTC

Given: J is the midpoint of $\overline{KM}$ and $\overline{NL}$.
Prove: $\overline{KL} \parallel \overline{MN}$



S	R
J mdpt of $\overline{KM}$, $\overline{NL}$	Given
$\overline{KJ} \cong \overline{JM}$, $\overline{NJ} \cong \overline{JL}$	Def. of mdpt
$\angle KJL \cong \angle MJN$	Vertical $\angle$'s Thm
$\triangle KJL \cong \triangle MJN$	SAS
$\angle KLJ \cong \angle MNJ$	CPCTC
$\overline{KL} \parallel \overline{MN}$	Converse of Alt. Int $\angle$'s Thm

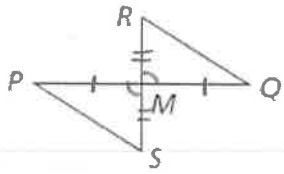
Given: $\overline{AC} \cong \overline{AD}$, $\overline{CB} \cong \overline{DB}$
Prove: $\overline{AB}$ bisects $\angle CAD$.



S	R
$\overline{AC} \cong \overline{AD}$, $\overline{CB} \cong \overline{DB}$	Given
$\overline{AB} \cong \overline{AB}$	Reflexive
$\triangle ABC \cong \triangle ABD$	SSS
$\angle CAB \cong \angle DAB$	CPCTC
$\overline{AB}$ bisects $\angle CAD$	Def. of bisector

Given: M is the midpoint of $\overline{PQ}$ and $\overline{RS}$.

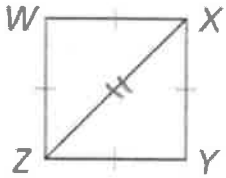
Prove: $\overline{QR} \cong \overline{PS}$



S	R
M mdpt of $\overline{PQ}$ + $\overline{RS}$	Given
$\overline{PM} \cong \overline{MQ}$, $\overline{RM} \cong \overline{MS}$	Def. of mdpt
$\angle RMQ \cong \angle SMP$	Vert. $\angle$'s Thm
$\triangle PMS \cong \triangle QMR$	SAS
$\overline{QR} \cong \overline{PS}$	CPCTC

Given: $\overline{WX} \cong \overline{XY} \cong \overline{YZ} \cong \overline{ZW}$

Prove: $\angle W \cong \angle Y$

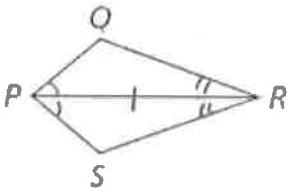


S	R
$\overline{WX} \cong \overline{XY} \cong \overline{YZ} \cong \overline{ZW}$	Given
$\overline{XZ} \cong \overline{XZ}$	Reflexive POC
$\triangle WZX \cong \triangle YXZ$	SSS
$\angle W \cong \angle Y$	CPCTC

Be careful about how to list your congruence statement here

Given: $\overline{PR}$ bisects $\angle QPS$ and $\angle QRS$.

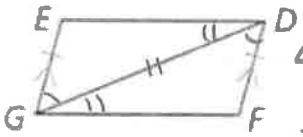
Prove: $\overline{PQ} \cong \overline{PS}$



S	R
$\overline{PR}$ bisects $\angle QPS$ + $\angle QRS$	Given
$\angle QPR \cong \angle SPR$, $\angle QRP \cong \angle SRP$	Def. of bisector
$\overline{PR} \cong \overline{PR}$	Reflexive POC
$\triangle QPS \cong \triangle SPR$	ASA
$\overline{PQ} \cong \overline{PS}$	CPCTC

Given: $\overline{EG} \parallel \overline{DF}$, $\overline{EG} \cong \overline{DF}$

Prove: $\overline{ED} \parallel \overline{GF}$



S	R
$\overline{EG} \parallel \overline{DF}$	Given
$\angle EGD \cong \angle FDG$	Alt int $\angle$'s Thm
$\overline{EG} \cong \overline{DF}$	Given
$\overline{DG} \cong \overline{DG}$	Reflexive POC
$\triangle EGD \cong \triangle FDG$	SAS
$\angle EDG \cong \angle FGD$	CPCTC
$\overline{ED} \parallel \overline{GF}$	Converse of Alt. Int $\angle$'s Thm