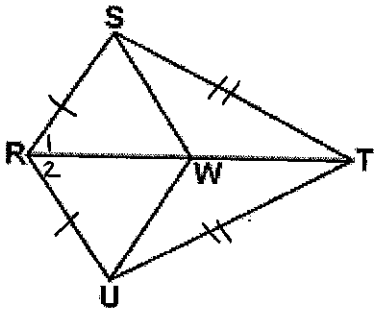
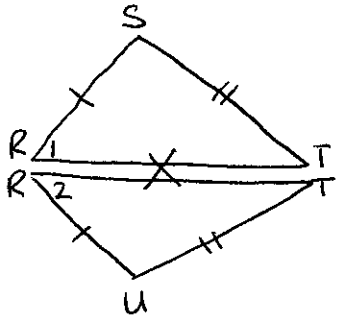
Name: Key Date: _____

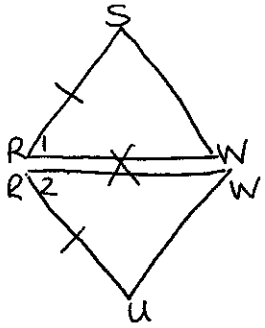
Double Triangle Congruence

Prove 1 pair of $\cong \triangle$s in order to prove a 2nd pair of $\cong \triangle$s

1.







Given: $\overline{RS} \cong \overline{RU}$, $\overline{ST} \cong \overline{UT}$

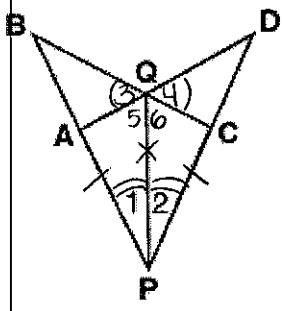
Prove: $\overline{SW} \cong \overline{UW}$

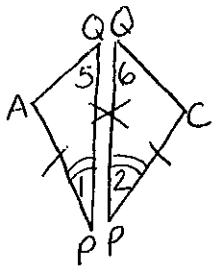
S	R
① $\overline{RS} \cong \overline{RU}$	① Given
② $\overline{ST} \cong \overline{UT}$	② Given
③ $\overline{RT} \cong \overline{RT}$	③ Reflexive Property
④ $\triangle RST \cong \triangle RUT$	④ SSS $\cong$ SSS
⑤ $\angle 1 \cong \angle 2$	⑤ CPCTC
⑥ $\overline{RW} \cong \overline{RW}$	⑥ Reflexive Property
⑦ $\triangle RSW \cong \triangle RUW$	⑦ SAS $\cong$ SAS
⑧ $\overline{SW} \cong \overline{UW}$	⑧ CPCTC

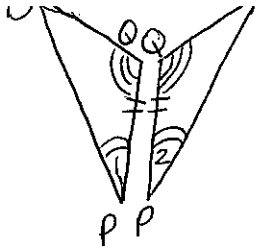
2

Given: $\overline{BC}$ and $\overline{AD}$ intersect at Q
$\angle 1 \cong \angle 2$
$\overline{AP} \cong \overline{PC}$

Prove: $\overline{QB} \cong \overline{QD}$

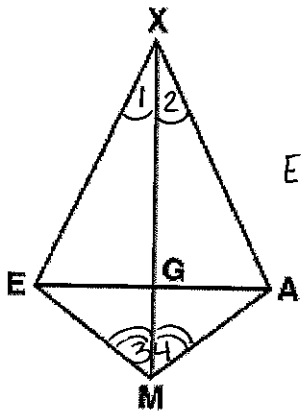


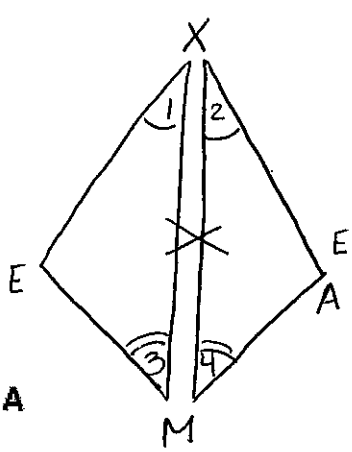


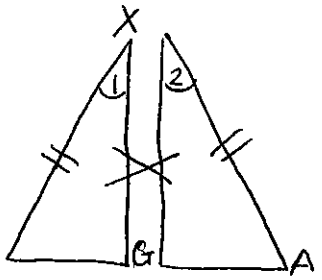


S	R
① BC & AD intersect at Q	① Given
② $\angle 3 \cong \angle 4$	② Intersecting lines form $\cong$ vertical $\angle$s
③ $\angle 1 \cong \angle 2$	③ Given
④ $\overline{AP} \cong \overline{CP}$	④ Given
⑤ $\overline{QP} \cong \overline{QP}$	⑤ Reflexive Property
⑥ $\triangle QAP \cong \triangle QCP$	⑥ SAS $\cong$ SAS
⑦ $\angle 5 \cong \angle 6$	⑦ CPCTC
⑧ $\angle 3 + \angle 5 \cong \angle 4 + \angle 6$	⑧ Addition Postulate
⑨ $\angle BQP = \angle 3 + \angle 5$ $\angle DQP = \angle 4 + \angle 6$	⑨ Partition Postulate
⑩ $\angle BQP \cong \angle DQP$	⑩ Substitution Postulate
⑪ $\triangle BQP \cong \triangle DQP$	⑪ ASA $\cong$ ASA
⑫ $\overline{QB} \cong \overline{QD}$	⑫ CPCTC

3.





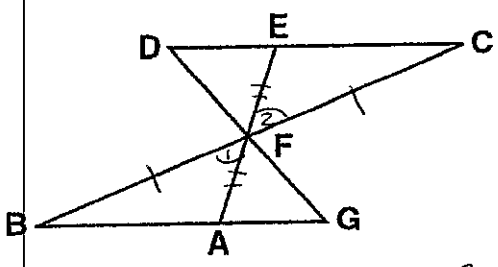


Given: In quadrilateral EXAM, $\overline{EA}$ intersects $\overline{XM}$ at G, and $\overline{XM}$ bisects $\angle EXA$ and $\angle EMA$.

Prove: $\overline{EG} \cong \overline{GA}$

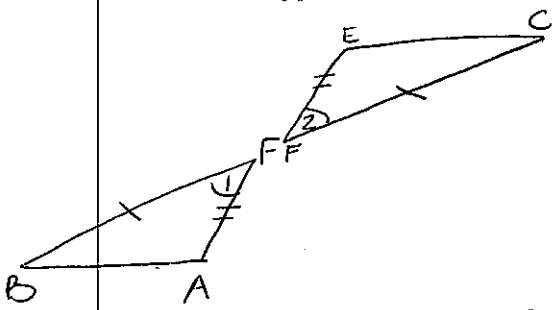
S	R
① Quad EXAM, $\overline{EA}$ intersects $\overline{XM}$	① Given
② $\overline{XM}$ bisects $\angle EXA$ & $\angle EMA$	② Given
③ $\angle 1 \cong \angle 2$ $\angle 3 \cong \angle 4$	③ An $\angle$ bisector divides an $\angle$ into 2 $\cong$ $\angle$s
④ $\overline{XM} \cong \overline{XM}$	④ Reflexive Property
⑤ $\triangle XEM \cong \triangle XAM$	⑤ ASA $\cong$ ASA
⑥ $\overline{XE} \cong \overline{XA}$	⑥ CPCTC
⑦ $\overline{XG} \cong \overline{XG}$	⑦ Reflexive Property
⑧ $\triangle XEG \cong \triangle XAG$	⑧ SAS $\cong$ SAS
⑨ $\overline{EG} \cong \overline{AG}$	⑨ CPCTC

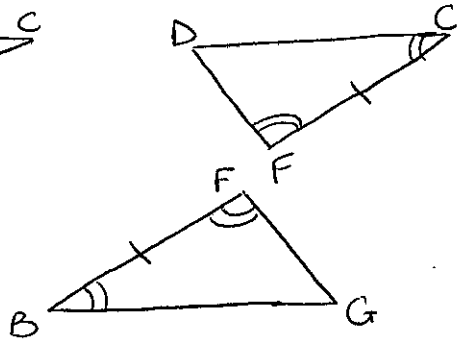
4.



Given: $\overline{BF} \cong \overline{CF}$
$\overline{EF} \cong \overline{FA}$

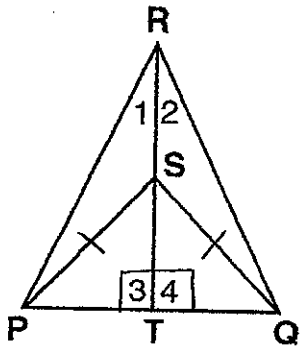
Prove: $\overline{DC} \cong \overline{BG}$





S	R
① $\overline{BF} \cong \overline{CF}$	① Given
② $\overline{EF} \cong \overline{AF}$	② Given
③ $\angle 1 \cong \angle 2$	③ Intersecting lines form $\cong$ vertical $\angle$s
④ $\triangle BFA \cong \triangle CFE$	④ SAS $\cong$ SAS
⑤ $\angle B \cong \angle C$	⑤ CPCTC
⑥ $\angle BFG \cong \angle CFD$	⑥ Intersecting lines form $\cong$ vertical $\angle$s
⑦ $\triangle BFG \cong \triangle CFD$	⑦ ASA $\cong$ ASA
⑧ $\overline{DC} \cong \overline{BG}$	⑧ CPCTC

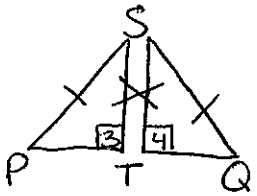
5.

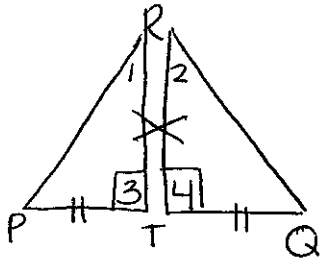


Given: $\overline{RT} \perp \overline{PQ}$

$\overline{PS} \cong \overline{SQ}$

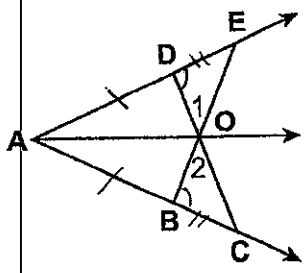
Prove: $\angle 1 \cong \angle 2$





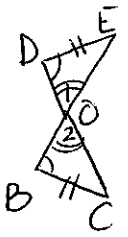
S	R
① $\overline{RT} \perp \overline{PQ}$	① Given
② $\angle 3$ & $\angle 4$ are right $\angle$s	② $\perp$ lines form right $\angle$s
③ $\angle 3 \cong \angle 4$	③ All right $\angle$s are $\cong$
④ $\overline{PS} \cong \overline{QS}$	④ Given
⑤ $\overline{ST} \cong \overline{ST}$	⑤ Reflexive Property
⑥ $\triangle PST$ & $\triangle QST$ are right $\triangle$s	⑥ A right $\triangle$ has 1 right $\angle$
⑦ $\triangle PST \cong \triangle QST$	⑦ HL $\cong$ HL
⑧ $\overline{PT} \cong \overline{QT}$	⑧ CPCTC
⑨ $\overline{RT} \cong \overline{RT}$	⑨ Reflexive Property
⑩ $\triangle PTR \cong \triangle QTR$	⑩ SAS $\cong$ SAS
⑪ $\angle 1 \cong \angle 2$	⑪ CPCTC

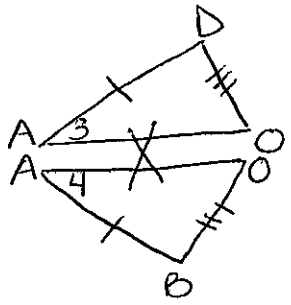
6.



Given: $\overline{AD} \cong \overline{AB}$
$\overline{DE} \cong \overline{BC}$
$\angle EDO \cong \angle CBO$

Prove: $\overline{AO}$ bisects $\angle DAB$





S	R
① $\overline{AD} \cong \overline{AB}$	① Given
② $\overline{DE} \cong \overline{BC}$	② Given
③ $\angle EDO \cong \angle CBO$	③ Given
④ $\angle 1 \cong \angle 2$	④ Intersecting lines form $\cong$ vertical $\angle$s
⑤ $\triangle EDO \cong \triangle CBO$	⑤ AAS $\cong$ AAS
⑥ $\overline{DO} \cong \overline{BO}$	⑥ CPCTC
⑦ $\overline{AO} \cong \overline{AO}$	⑦ Reflexive Property
⑧ $\triangle ADO \cong \triangle ABO$	⑧ SSS $\cong$ SSS
⑨ $\angle 3 \cong \angle 4$	⑨ CPCTC
⑩ $\overline{AO}$ bisects $\angle DAB$	⑩ An $\angle$ bisector divides an $\angle$ into 2 $\cong$ $\angle$s