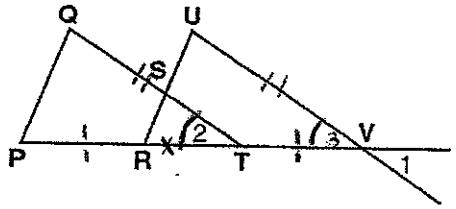
Name: _____ Congruent Date: 11/9

Corresponding parts of triangles are congruent

Congruent Triangle Proofs Day 3 (CPCTC)

1.



Given: $\overline{PR} \cong \overline{TV}$ ✓
$\angle 1 \cong \angle 2$ ✓
$\overline{QT} \cong \overline{UV}$ ✓

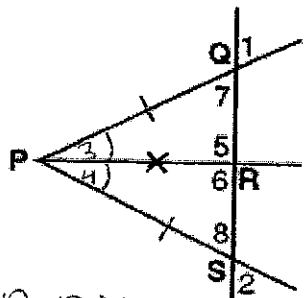
Prove: $\angle Q \cong \angle U$

S	r
① $\overline{PR} \cong \overline{TV}$	① Given
② $\overline{RT} \cong \overline{RT}$	② Reflexive
③ $\overline{PR} \cong \overline{TV}$ + $\overline{RT} \cong \overline{RT}$	③ addition postulate
$\overline{PT} \cong \overline{RV}$	
④ $\angle 1 \cong \angle 2$	④ Given
⑤ $\angle 1 \cong \angle 3$	⑤ intersecting lines form vertical ≅ angles
⑥ $\angle 2 \cong \angle 2$	⑥ transitive
⑦ $\overline{QT} \cong \overline{UV}$	⑦ Given
⑧ $\triangle RUV \cong \triangle PQT$	⑧ SAS
⑨ $\angle Q \cong \angle U$	⑨ Corresponding parts of congruent triangles are congruent

2.

Given: $\overline{PQ} \cong \overline{PS}$ ✓
$\overline{PR}$ bisects $\angle QPS$ ✓

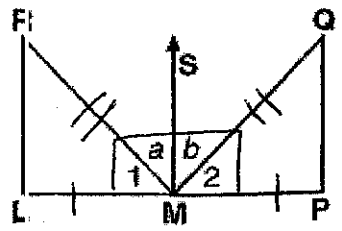
Prove: $\angle 1 \cong \angle 2$



* can not use CPCTC without first proving ≅ △'s *

S	r
① $\overline{PQ} \cong \overline{PS}$	① Given
② $\overline{PR}$ bisects $\angle QPS$	② an angle bisector divides an angle into 2 ≅ angles
③ $\overline{PR} \cong \overline{PR}$	③ Reflexive
④ $\triangle QPR \cong \triangle SPR$	④ SAS
⑤ $\angle 7 \cong \angle 8$ ←	⑤ Corresponding parts of congruent triangle are congruent
⑥ $\angle 1 \cong \angle 7$ ←	⑥ intersecting lines form congruent vertical angles
$\angle 2 \cong \angle 8$ ←	
⑧ $\angle 1 \cong \angle 8$ ←	⑧ transitive
⑨ $\angle 1 \cong \angle 2$	⑨ transitive

3.

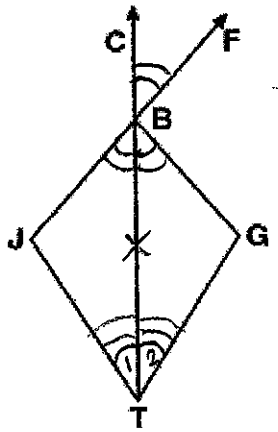


Given: $\overline{MS}$ is ⊥ bisector of $\overline{LP}$
$RM = MQ$
$\angle a = \angle b$

Prove: $\triangle RLM \cong \triangle QPM$

S	R
① $\overleftrightarrow{MS}$ is ⊥ bisector of $\overline{LP}$	① Given
② $\angle LMS$ & $\angle PMS$ are right $\angle$s	② ⊥ lines form right $\angle$s
③ $\angle LMS \cong \angle PMS$	③ All right $\angle$s are $\cong$
④ $\overline{LM} \cong \overline{PM}$	④ A segment bisector cuts a segment into 2 $\cong$ segments
⑤ $\overline{RM} \cong \overline{QM}$	⑤ Given
⑥ $\angle a \cong \angle b$	⑥ Given
⑦ $\angle LMS \cong \angle PMS$ − $\angle a \cong \angle b$ / $\angle 1 \cong \angle 2$	⑦ Subtraction Postulate
⑧ $\triangle RLM \cong \triangle QPM$	⑧ SAS

4.



Given: $\angle CBF \cong \angle TBG$
$\overline{TB}$ bisects $\angle JTG$

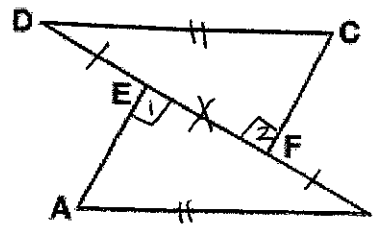
Prove: $\triangle BJT \cong \triangle BGT$

First prove $\triangle$s Congruent

$\overline{JT} \cong \overline{GT}$

Statement:	Reason
① $\angle CBF \cong \angle TBG$	① Given
② $\angle CBF \cong \angle TBJ$	② Intersecting lines form $\cong$ vertical angles
③ $\angle TBG \cong TBJ$	③ Transitive property
④ $\overline{TB}$ bisects $\angle JTG$	④ Given
⑤ $\angle 1 \cong \angle 2$	⑤ an angle bisector divides an angle into 2 $\cong$ angles
⑥ $\overline{BT} \cong \overline{BT}$	⑥ Reflexive property
⑦ $\triangle BJT \cong \triangle BGT$	⑦ ASA $\cong$ ASA
⑧ $\overline{JT} \cong \overline{GT}$	⑧ Corresponding Part of $\cong$ $\triangle$'s are $\cong$

5.

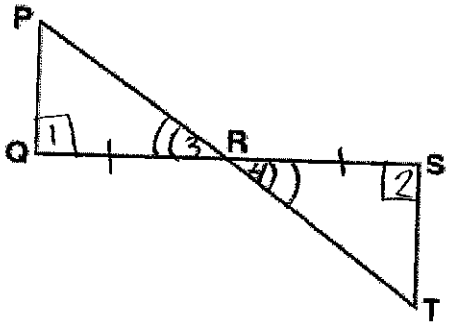


Given: $\overline{AE} \perp \overline{DB}$
$\overline{CF} \perp \overline{DB}$
$DE = FB$
$DC = AB$

Prove: $\angle D \cong \angle B$

S	R
① $\overline{AE} \perp \overline{DB}$, $\overline{CF} \perp \overline{DB}$	① Given
② $\angle 1$ & $\angle 2$ are right $\angle$s	② $\perp$ lines form right $\angle$s
③ $\angle 1 \cong \angle 2$	③ All right $\angle$s are $\cong$
④ $\overline{DE} \cong \overline{FB}$	④ Given
⑤ $\overline{EF} \cong \overline{EF}$	⑤ Reflexive
⑥ $\overline{DE} \cong \overline{FB}$ $+\ \overline{EF} \cong \overline{EF}$ $\overline{DF} \cong \overline{BE}$	⑥ Addition Postulate
⑦ $\overline{DC} \cong \overline{AB}$	⑦ Given
⑧ $\triangle DFC$ & $\triangle BEA$ are right $\triangle$s	⑧ Right $\triangle$s have 1 right $\angle$
⑨ $\triangle DFC \cong \triangle BEA$	⑨ HL
⑩ $\angle D \cong \angle B$	⑩ CPCTC

6.



Given: $\overline{PQ} \perp \overline{QS}$
$\overline{TS} \perp \overline{QS}$
R is the midpoint of $\overline{QS}$

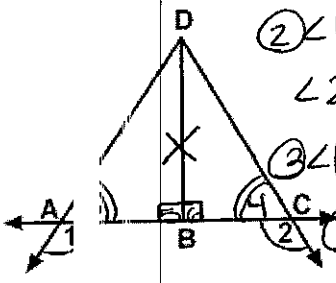
Prove $\triangle$ Congruent first

Prove: $\angle P \cong \angle T$

Statement:	Reason:
① $\overline{PQ} \perp \overline{QS}$ $\overline{TS} \perp \overline{QS}$	① Given
② $\angle 1 + \angle 2$ are right angles	② $\perp$ lines form right angles
③ $\angle 1 \cong \angle 2$	③ All right angles are $\cong$.
④ R is the midpoint of $\overline{QS}$	④ Given
⑤ $\overline{QR} \cong \overline{SR}$	⑤ A midpoint divides a segment into 2 $\cong$ segments
⑥ $\angle 3 \cong \angle 4$	⑥ intersecting lines form $\cong$ vertical angles
⑦ $\triangle PQR \cong \triangle TSR$	⑦ ASA
⑧ $\angle P \cong \angle T$	⑧ Corresponding Parts of $\cong$ $\triangle$s are $\cong$

7.

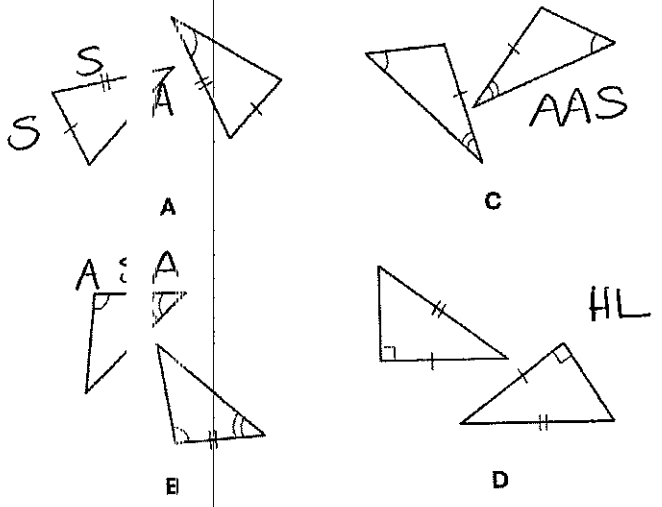
Given: $\angle 1 \cong \angle 2$ and $DB \perp AC$



Prove by any method: $\triangle ABD \cong \triangle CBD$

S	R
① $\angle 1 \cong \angle 2$	① Given
② $\angle 1 + \angle 3 = 180$	② Supplementary $\angle$s
$\angle 2 + \angle 4 = 180$	add up to 180
③ $\angle 1 + \angle 3 = \angle 2 + \angle 4$	③ Substitution
④ $\angle 1 + \angle 3 = \angle 2 + \angle 4$	④ Subtraction
$-\angle 1 = \angle 2$	Postulate
$\angle 3 = \angle 4$	
⑤ $\overline{DB} \perp \overline{AC}$	⑤ Given
⑥ $\angle 5$ & $\angle 6$ are right $\angle$s	⑥ $\perp$ lines form right $\angle$s
⑦ $\angle 5 \cong \angle 6$	⑦ All right $\angle$s are $\cong$
⑧ $\overline{DB} \cong \overline{DB}$	⑧ Reflexive
⑨ $\triangle ABD \cong \triangle CBD$	⑨ AAS

8. In the diagram below, four pairs of triangles are shown. Congruent corresponding parts are labeled in each pair.



A

C

B

D

Using only the information given in the diagrams, which pair of triangles can *not* be proven congruent?

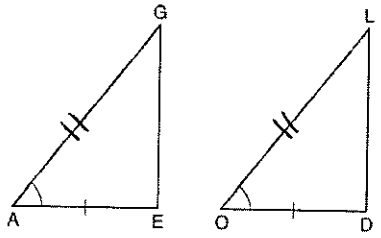
1) *A*

2) *B*

3) *C*

4) *D*

9. In the diagram below of ΔAGE and ΔOLD, $\angle GAE \cong \angle LOD$, and $\overline{AE} \cong \overline{OD}$.



To prove that ΔAGE and ΔOLD are congruent by SAS, what other information is needed?

1) $\overline{GE} \cong \overline{LD}$

● $\overline{AG} \cong \overline{OL}$

3) $\angle AGE \cong \angle OLD$

4) $\angle AEG \cong \angle ODL$

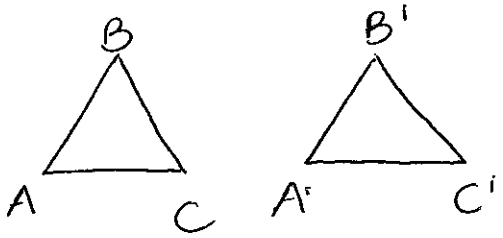
10. Which statements could be used to prove that $\triangle ABC$ and $\triangle A'B'C'$ are congruent?

SSA 1) $\overline{AB} \cong \overline{A'B'}$, $\overline{BC} \cong \overline{B'C'}$, and $\angle A \cong \angle A'$

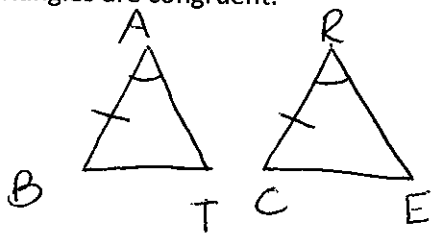
AAS ● $\overline{AB} \cong \overline{A'B'}$, $\angle A \cong \angle A'$, and $\angle C \cong \angle C'$

AAA 3) $\angle A \cong \angle A'$, $\angle B \cong \angle B'$, and $\angle C \cong \angle C'$

SSA 4) $\angle A \cong \angle A'$, $\overline{AC} \cong \overline{A'C'}$, and $\overline{BC} \cong \overline{B'C'}$



11. In $\triangle BAT$ and $\triangle CRE$, $\angle A \cong \angle R$ and $\overline{BA} \cong \overline{CR}$. Write *one* additional statement that could be used to prove that the two triangles are congruent. State the method that would be used to prove that the triangles are congruent.



if $\overline{AT} \cong \overline{RE}$ then SAS

if $\angle B \cong \angle C$ then ASA

if $\angle T \cong \angle E$ then AAS