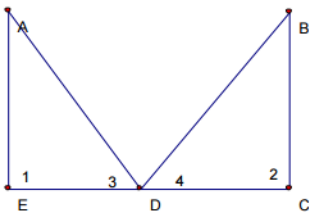


ANSWER KEY

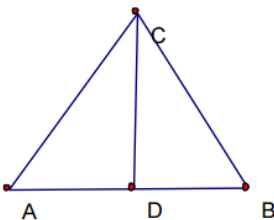
Practice with Congruent Triangles

1. **Given:** $\overline{AE} \perp \overline{ED}$
 $\overline{BC} \perp \overline{CD}$
D is the midpoint of \overline{EC} .
 $\angle 3 \cong \angle 4$
Prove: $\triangle AED \cong \triangle BCD$



Statements	Reasons
① $\overline{AE} \perp \overline{ED}, \overline{BC} \perp \overline{CD}$	① given
② $\angle 1$ and $\angle 2$ are right \angle 's	② def. of \perp lines
③ $\angle 1 \cong \angle 2$ (A)	③ all rt \angle 's \cong
④ D is the mdpt of \overline{EC}	④ given
⑤ $\overline{ED} \cong \overline{CD}$ (S)	⑤ def. of mdpt
⑥ $\angle 3 \cong \angle 4$ (A)	⑥ given
⑦ $\triangle AED \cong \triangle BCD$	⑦ ASA (3, 5, 6)

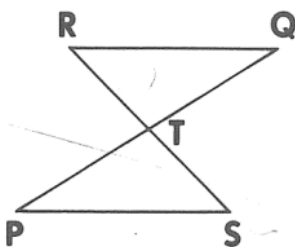
2. **Given:** $\overline{AC} \cong \overline{CB}$
 \overline{CD} bisects \overline{AB}
Prove: $\triangle ADC \cong \triangle BDC$



Statements	Reasons
① $\overline{AC} \cong \overline{CB}$ (S)	① given
② \overline{CD} bisects \overline{AB}	② given
③ D is the mdpt of \overline{AB}	③ def. of seg bisector
④ $\overline{AD} \cong \overline{BD}$ (S)	④ def. of mdpt
⑤ $\overline{CD} \cong \overline{CD}$ (S)	⑤ Reflexive prop
⑥ $\triangle ADC \cong \triangle BDC$	⑥ SSS (1, 4, 5)

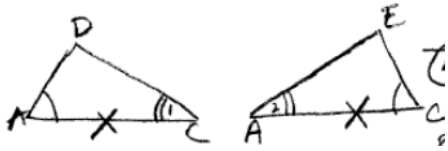
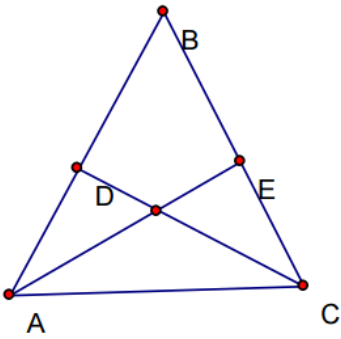
3.

- Given:** \overline{RS} bisects \overline{PQ} at T, \overline{PQ} bisects \overline{RS} at T.
Prove: $\triangle PTS \cong \triangle QTR$



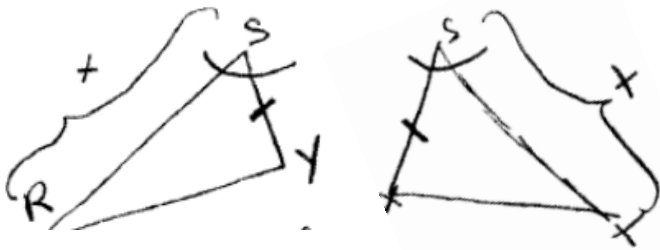
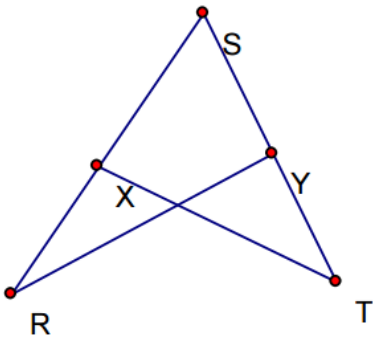
Statements	Reasons
① \overline{RS} bisects \overline{PQ} at T	① given
② T is the mdpt of \overline{PQ}	② def. of seg bisector
③ $\overline{PT} \cong \overline{QT}$ (S)	③ def. of mdpt
④ \overline{PQ} bisects \overline{RS} at T	④ given
⑤ T is the mdpt of \overline{RS}	⑤ def. of seg bisector
⑥ $\overline{RT} \cong \overline{ST}$ (S)	⑥ def. of mdpt
⑦ $\angle 1 \cong \angle 2$ (A)	⑦ vertical \angle 's are \cong
⑧ $\triangle PTS \cong \triangle QTR$	⑧ SAS (3, 7, 6)

4. Given: $\angle BAC \cong \angle BCA$
 \overline{CD} bisects $\angle BCA$
 \overline{AE} bisects $\angle BAC$
 Prove: $\triangle ADC \cong \triangle CEA$



S	R
① $\angle BAC \cong \angle BCA$ (A) \overline{CD} bisects $\angle BCA$ \overline{AE} bisects $\angle BAC$	① given
② $\frac{1}{2}\angle BCA \cong \angle 1$ $\frac{1}{2}\angle BAC \cong \angle 2$	② def. of \angle bisector
③ $\angle 1 \cong \angle 2$ (A)	③ halves of \cong are \cong or Division Post.
④ $\overline{AC} \cong \overline{CA}$ (S)	④ Reflexive Prop.
⑤ $\triangle ADC \cong \triangle CEA$	⑤ ASA (1, 4, 3)

5. Given: \overline{SR} and \overline{ST} are straight lines.
 $\overline{SX} \cong \overline{SY}$
 $\overline{XR} \cong \overline{YT}$
 Prove: $\triangle RSY \cong \triangle TSX$

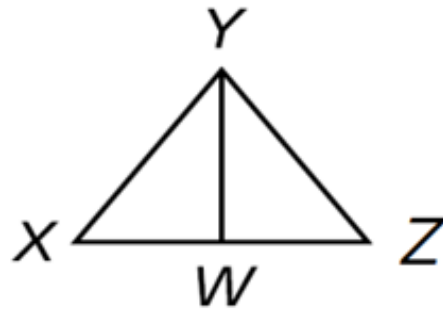


S	R
① $\overline{SX} \cong \overline{SY}$, $\overline{XR} \cong \overline{YT}$ (S)	① given
② $\angle S \cong \angle S$ (A)	② Reflexive Prop.
③ $\overline{SR} \cong \overline{ST}$ (S)	③ Addition Prop. (1, 1)
④ $\triangle RSY \cong \triangle TSX$	④ SAS (1, 2, 3)

Example 1:

Given: W is the midpoint of \overline{XZ} , $\overline{XY} \cong \overline{ZY}$

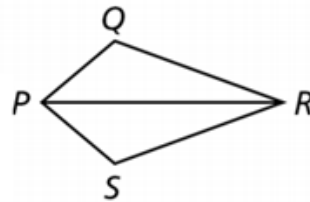
Prove: $\angle XYW \cong \angle ZYW$



Statement	Reason
1. W is midpoint of XZ	1. Given
2. $XW \cong ZW$ (S)	2. Definition of midpoint
3. $XY \cong ZY$ (S)	3. Given
4. $YW \cong YW$ (S)	4. Symmetric Property
5. $\triangle XYW \cong \triangle ZYW$	5. SSS
6. $\angle XYW \cong \angle ZYW$	6. CPCTC

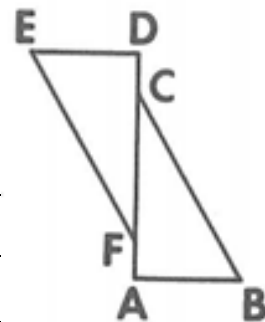
Example 2: Given: \overline{PR} bisects $\angle QPS$ and $\angle QRS$.

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



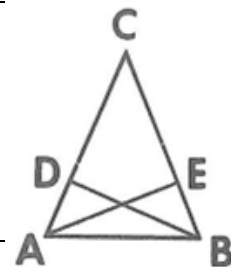
Statement	Reason
1. PR bisects $\angle QPS$ & $\angle QRS$	1. Given
2. $\angle QPR \cong \angle SPR$ (A)	2. Definition of angle bisector
3. $\angle QRS \cong \angle SRP$ (A)	3. Definition of angle bisector
4. $PR \cong PR$ (S)	4. Symmetric Property
5. $\triangle PQR \cong \triangle PSR$	5. ASA
6. $PQ \cong PS$	6. CPCTC

3. Given: \overline{AFCD} , $\overline{ED} \perp \overline{DA}$, $\overline{BA} \perp \overline{DA}$, $\overline{DC} \cong \overline{AF}$, and $\angle E \cong \angle B$.
 Prove: $\overline{EF} \cong \overline{BC}$.



Statement	Reason
1. $ED \perp DA$, $BA \perp DA$	1. Given
2. $\angle D$ and $\angle A$ are right	2. Definition of perpendicular.
3. $\angle D \cong \angle A$ (A)	3. All right angles are \cong
4. $\angle E \cong \angle B$ (A)	4. Given
5. $DC \cong AF$	5. Given
6. $DC + CF \cong AF + CF$	6. Addition Prop (added CF to both)
7. $DC + CF = DF$, $AF + CF = AC$	7. Segment Addition Postulate
8. $DF \cong AC$ (S)	8. Substitution
9. $\triangle EDF \cong \triangle BAC$	9. AAS
10. $EF \cong BC$	10. CPCTC

4. Given: In $\triangle ACB$, $\overline{AC} \cong \overline{BC}$ and $\angle ADB \cong \angle BEA$.
 Prove: $\overline{AE} \cong \overline{BD}$.



Statement	Reason
1. $AC \cong BC$	1. Given
2. $\triangle ACB$ is isosceles	2. Definition of Isosceles Triangle
3. $\angle CAB \cong \angle CBA$ (A)	3. In Isos. \triangle , base angles are \cong (aka Base Angle Theorem)
4. $\angle ADB \cong \angle BEA$ (A)	4. Given
5. $AB \cong BA$ (S)	5. Reflexive Property
6. $\triangle ADB \cong \triangle BEA$	6. AAS
7. $AE \cong BD$	7. CPCTC