Congruent Triangles: Missing Reasons Activity

Methods Of Proving Triangles Congruent

Directions: Choose the missing reasons from the box below each proof and write them next to their corresponding statement. Not all the reasons will be used.

Given: B is the midpoint of $\overline{AC}$, $\overline{AD} \cong \overline{CD}$

Prove: $\triangle DAB \cong \triangle CDB$

Statements	Reasons
1. B is the midpoint of $\overline{AC}$, $\overline{AD} \cong \overline{CD}$	Given
2. $\overline{AB} \cong \overline{CB}$	Definition of midpoint
3. $\overline{DB} \cong \overline{DB}$	Reflexive Property
4. $\triangle ADB \cong \triangle CDB$	SSS

Definition of right triangle   HL   ⊥ lines form right angles

Definition of midpoint   Reflexive Property   Given   SSS

Given: $\overline{AD} \cong \overline{CB}$; $\overline{AD} \parallel \overline{BC}$

Prove: $\triangle ADB \cong \triangle CBD$

Statements	Reasons
	Given

...erior angle are congruent
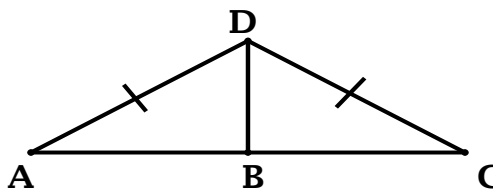
Name: _____**Answer Key**_____ Hour: _____ Date: _____

Methods Of Proving Triangles Congruent: Missing Reasons

Directions: Choose the missing reasons from the box below each proof and write them next to their corresponding statement. Not all the reasons will be used.

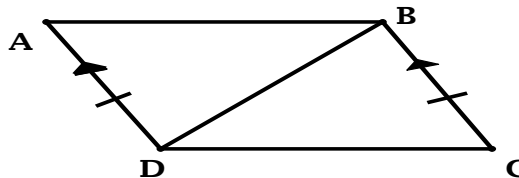**Given:** B is the midpoint of $\overline{AC}$, $\overline{AD} \cong \overline{CD}$

Prove: $\triangle DAB \cong \triangle CDB$

Statements	Reasons
1. B is the midpoint of $\overline{AC}$, $\overline{AD} \cong \overline{CD}$	Given
2. $\overline{AB} \cong \overline{CB}$	Definition of midpoint
3. $\overline{DB} \cong \overline{DB}$	Reflexive Property
4. $\triangle ADB \cong \triangle CDB$	SSS

> Definition of right triangle   HL   ⊥ lines form right angles
>
> Definition of midpoint   Reflexive Property   Given   SSS

Given: $\overline{AD} \cong \overline{CB}$; $\overline{AD} \parallel \overline{PS}$
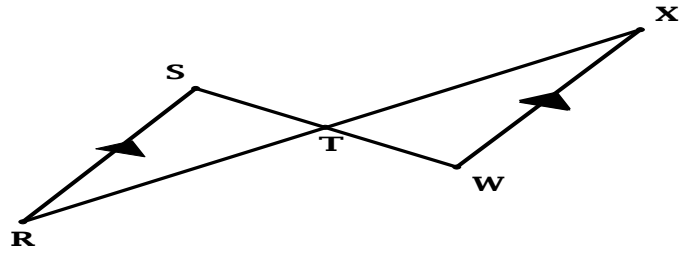
Prove: $\triangle ADB \cong \triangle CBD$

Statements	Reasons
1. $\overline{AD} \cong \overline{CB}$; $\overline{AD} \parallel \overline{PS}$	Given
2. $\angle ADB \cong \angle CBD$	Alternate interior angle are congruent
3. $\overline{DB} \cong \overline{DB}$	Reflexive Property
4. $\triangle ADB \cong \triangle CBD$	SAS

> Alternate interior angle are congruent   SAS   Reflexive Property   ASA
>
> Definition of midpoint   Vertical angles are congruent   Given

Given: T is the midpoint of $\overline{SW}$;
$\overline{SR} \parallel \overline{WX}$

Prove: $\triangle SRT \cong \triangle WXT$

Statements	Reasons
1. T is the midpoint of $\overline{SW}$; $\overline{SR} \parallel \overline{WX}$	Given
2. $\overline{ST} \cong \overline{WT}$	Definition of midpoint
3. $\angle SRT \cong \angle WXT$	Alternate interior angles are congruent
4. $\angle RTS \cong \angle XTW$	Vertical angles are congruent
5. $\triangle SRT \cong \triangle WXT$	AAS

Alternate interior angle are congruent   AAS   Given   SAS

Reflexive Property   Definition of midpoint   Vertical angles are congruent

Consecutive interior angles are congruent   ASA

Given: $\overline{OA} \parallel \overline{CE}$; $\overline{AB} \cong \overline{CB}$
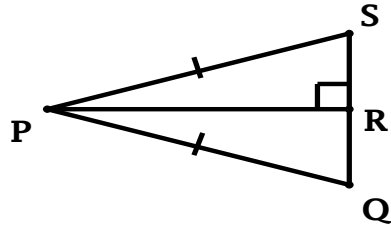
Prove: $\triangle AOB \cong \triangle CEB$

Statements	Reasons
1. $\overline{OA} \parallel \overline{CE}$; $\overline{AB} \cong \overline{CB}$	Given
2. $\angle OAB \cong \angle CEB$	Alternate interior angles are congruent
3. $\angle ABO \cong \angle CBE$	Vertical angles are congruent
4. $\triangle AOB \cong \triangle CEB$	ASA

Consecutive interior angles are congruent   ASA   Definition of midpoint   AAS

Alternate interior angles are congruent   Vertical angles are congruent   Given

Given: $\overline{PR} \perp \overline{SQ}$; $\overline{PQ} \cong \overline{PS}$

Prove: $\triangle PRQ \cong \triangle PRS$

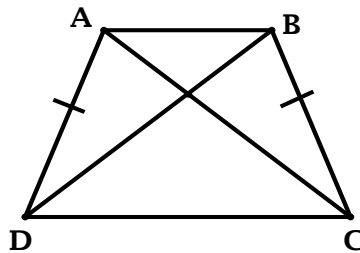| Statements	Reasons
1. $\overline{PR} \perp \overline{SQ}$	Given
2. $\angle PRQ$ and $\angle PRS$ are right angles	$\perp$ lines form right angles
3. $\triangle PRQ$ and $\triangle PRS$ are right triangles	Definition of right triangle
4. $\overline{PQ} \cong \overline{PS}$	Given
5. $\overline{PR} \cong \overline{PR}$	Reflexive Property
6. $\triangle PRQ \cong \triangle PRS$	HL

$\perp$ lines form right angles   Given   Reflexive Property   HL   ASA

Definition of right triangle   Definition of midpoint   SSS   Given

Alternate interior angles are congruent   Vertical angles are congruent

---

Given: $\overline{BC} \cong \overline{AD}$; $\overline{BD} \cong \overline{AC}$
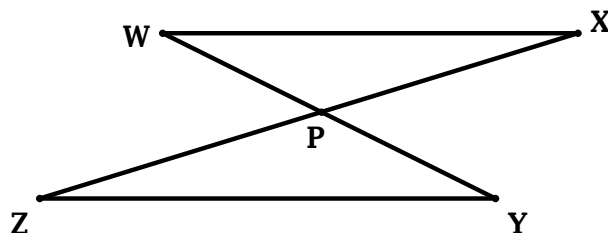
Prove: $\angle BAC \cong \angle ABD$

Statements	Reasons
1. $\overline{BC} \cong \overline{AD}$; $\overline{BD} \cong \overline{AC}$	Given
2. $\overline{AB} \cong \overline{BA}$	Reflexive Property
3. $\triangle BAD \cong \triangle ABC$	SSS
4. $\angle BAC \cong \angle ABD$	CPCTC

ASA   CPCTC   Definition of midpoint   Definition of segment bisector

SSS   AAS   Given   Alternate interior angles are congruent   Reflexive Property

**Given:** WY and XZ bisect each other at P

Prove: ∆WPX ≅ ∆YPZ

Statements	Reasons
1: WY and XZ bisect each other at P	Given
2. $\overline{WP} \cong \overline{YP}$; $\overline{XP} \cong \overline{ZP}$	Definition of segment bisector
3. ∠ADB ≅ ∠CBD	Vertical angles are congruent
4. ∆WPX ≅ ∆YPZ	SAS

Given   SAS   ASA   Definition of segment bisector   Definition of midpoint

SSS   Definition of angle bisector   Vertical angles are congruent

Given: $\overline{XZ}$ bisects ∠YXW and ∠YZW
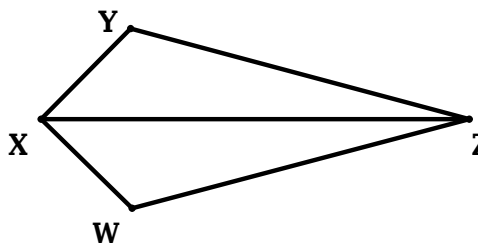
Prove: ∆XYZ ≅ ∆XWZ

Statements	Reasons
1. $\overline{XZ}$ bisects ∠YXW and ∠YZW	Given
2. ∠YXZ ≅ ∠WXZ	Definition of angle bisector
3. ∠YZX ≅ ∠WZX	Definition of angle bisector
4. $\overline{XZ} \cong \overline{XZ}$	Reflexive Property
5. ∆XYZ ≅ ∆XWZ	ASA

Definition of midpoint   Definition of segment bisector   Reflexive Property

SSS   Vertical angles are congruent   ASA   SAS   Definition of angle bisector   Given

© ("Secondary Math Shop") 2013

Given: ∠1 ≅ ∠2 ; ∠3 ≅ ∠4
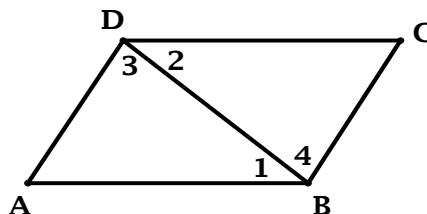
Prove: $\overline{AB} \cong \overline{CD}$

Statements	Reasons
1. ∠1 ≅ ∠2 ; ∠3 ≅ ∠4	Given
2. $\overline{DB} \cong \overline{DB}$	Reflexive Property
3. △ABD ≅ △CDB	ASA
4. $\overline{AB} \cong \overline{CD}$	CPCTC

Definition of midpoint   Definition of segment bisector   CPCTC

Reflexive Property   SSS   ASA   SAS   Definition of angle bisector   Given

---
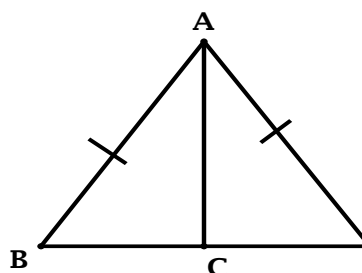
Given: $\overline{AC} \perp \overline{BD}$; $\overline{AB} \cong \overline{AD}$

Prove: ∠BAC ≅ ∠DAC

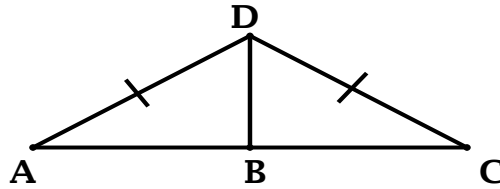| Statements	Reasons
1. $\overline{AC} \perp \overline{BD}$; $\overline{AB} \cong \overline{AD}$	Given
2. ∠ACB and ∠ACD are right angles	⊥ lines form right angles
3. ∠ACB ≅ ∠ACD	All right angles are congruent
4. $\overline{AC} \cong \overline{AC}$	Reflexive
5. △ABC ≅ △ADC	HL
6. ∠BAC ≅ ∠DAC	CPCTC

⊥ lines form right angles   Given   Reflexive Property   HL   ASA

Definition of right triangle   Definition of midpoint   SSS   CPCTC

Vertical angles are congruent   All right angles are congruent

Methods Of Proving Triangles Congruent: Missing Reasons

Directions: Choose the missing reasons from the box below each proof and write them next to their corresponding statement. Not all the reasons will be used.

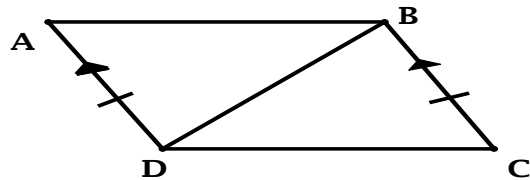**Given:** B is the midpoint of $\overline{AC}$, $\overline{AD} \cong \overline{CD}$

Prove: $\triangle DAB \cong \triangle CDB$

Statements	Reasons
1. B is the midpoint of $\overline{AC}$, $\overline{AD} \cong \overline{CD}$	
2. $\overline{AB} \cong \overline{CB}$	
3. $\overline{DB} \cong \overline{DB}$	
4. $\triangle ADB \cong \triangle CDB$	

Definition of right triangle   HL   ⊥ lines form right angles

Definition of midpoint   Reflexive Property   Given   SSS

Given: $\overline{AD} \cong \overline{CB}$; $\overline{AD} \parallel \overline{PS}$
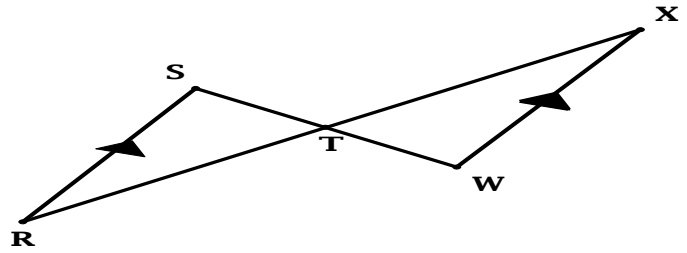
Prove: $\triangle ADB \cong \triangle CBD$

Statements	Reasons
1. $\overline{AD} \cong \overline{CB}$; $\overline{AD} \parallel \overline{PS}$	
2. $\angle ADB \cong \angle CBD$	
3. $\overline{DB} \cong \overline{DB}$	
4. $\triangle ADB \cong \triangle CBD$	

Alternate interior angle are congruent   SAS   Reflexive Property   ASA

Definition of midpoint   Vertical angles are congruent   Given

Given: T is the midpoint of $\overline{SW}$;
$\overline{SR} \parallel \overline{WX}$

Prove: $\triangle SRT \cong \triangle WXT$

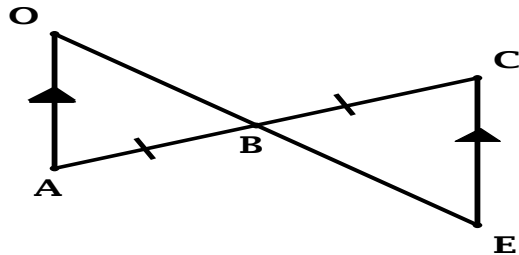| Statements	Reasons
1. T is the midpoint of $\overline{SW}$; $\overline{SR} \parallel \overline{WX}$	
2. $\overline{ST} \cong \overline{WT}$	
3. $\angle SRT \cong \angle WXT$	
4. $\angle RTS \cong \angle XTW$	
5. $\triangle SRT \cong \triangle WXT$	

Alternate interior angle are congruent   AAS   Given   SAS

Reflexive Property   Definition of midpoint   Vertical angles are congruent

Consecutive interior angles are congruent   ASA

Given: $\overline{OA} \parallel \overline{CE}$; $\overline{AB} \cong \overline{CB}$

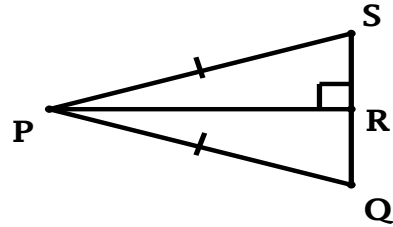Prove: $\triangle AOB \cong \triangle CEB$

Statements	Reasons
1. $\overline{OA} \parallel \overline{CE}$; $\overline{AB} \cong \overline{CB}$	
2. $\angle OAB \cong \angle CEB$	
3. $\angle ABO \cong \angle CBE$	
4. $\triangle AOB \cong \triangle CEB$	

Consecutive interior angles are congruent   ASA   Definition of midpoint   AAS

Alternate interior angles are congruent   Vertical angles are congruent   Given

Given: $\overline{PR} \perp \overline{SQ}$; $\overline{PQ} \cong \overline{PS}$

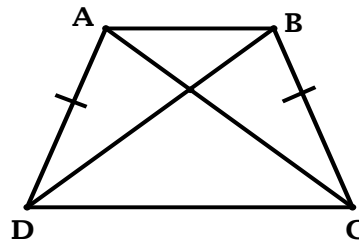**Prove:** $\triangle PRQ \cong \triangle PRS$

Statements	Reasons
1. $\overline{PR} \perp \overline{SQ}$	
2. ∠PRQ and ∠PRS are right angles	
3. $\triangle PRQ$ and $\triangle PRS$ are right triangles	
4. $\overline{PQ} \cong \overline{PS}$	
5. $\overline{PR} \cong \overline{PR}$	
6. $\triangle PRQ \cong \triangle PRS$	

⊥ lines form right angles   Given   Reflexive Property   HL   ASA

Definition of right triangle   Definition of midpoint   SSS   Given

Alternate interior angles are congruent   Vertical angles are congruent

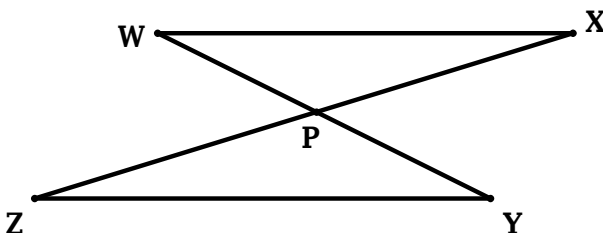**Given:** $\overline{BC} \cong \overline{AD}$; $\overline{BD} \cong \overline{AC}$

Prove: ∠BAC ≅ ∠ABD

Statements	Reasons
1. $\overline{BC} \cong \overline{AD}$; $\overline{BD} \cong \overline{AC}$	
2. $\overline{AB} \cong \overline{BA}$	
3. $\triangle BAD \cong \triangle ABC$	
4. ∠BAC ≅ ∠ABD	

ASA   CPCTC   Definition of midpoint   Definition of segment bisector

SSS   AAS   Given   Alternate interior angles are congruent   Reflexive Property
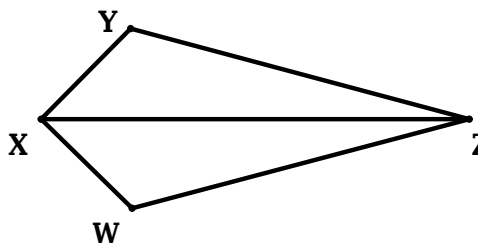
Given: WY and XZ bisect
each other at P

Prove: ΔWPX ≅ Δ YPZ

Statements	Reasons
1: WY and XZ bisect each other at P	
2. $\overline{WP}$ ≅ $\overline{YP}$; $\overline{XP}$ ≅ $\overline{ZP}$	
3. ∠ADB ≅ ∠CBD	
4. ΔWPX ≅ Δ YPZ	

Given   SAS   ASA   Definition of segment bisector   Definition of midpoint

SSS   Definition of angle bisector   Vertical angles are congruent

Given: $\overline{XZ}$ bisects ∠YXW
and ∠YZW
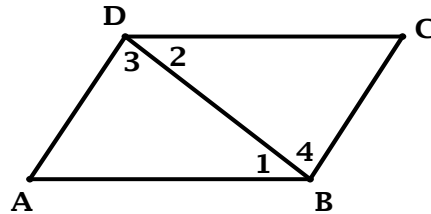
Prove: ΔXYZ ≅ Δ XWZ

Statements	Reasons
1. $\overline{XZ}$ bisects ∠YXW and ∠YZW	
2. ∠YXZ ≅ ∠WXZ	
3. ∠YZX ≅ ∠WZX	
4. $\overline{XZ}$ ≅ $\overline{XZ}$	
5. ΔXYZ ≅ Δ XWZ	

Definition of midpoint   Definition of segment bisector   Reflexive Property

SSS   Vertical angles are congruent   ASA   SAS   Definition of angle bisector   Given

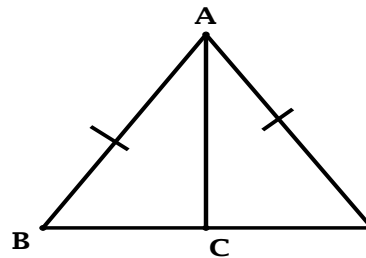**Given:** $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$

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

Statements	Reasons
1. $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$	
2. $\overline{DB} \cong \overline{DB}$	
3. $\triangle ABD \cong \triangle CDB$	
4. $\overline{AB} \cong \overline{CD}$	

Definition of midpoint   Definition of segment bisector   CPCTC

Reflexive Property   SSS   ASA   SAS   Definition of angle bisector   Given

Given: $\overline{AC} \perp \overline{BD}$; $\overline{AB} \cong \overline{AD}$

Prove: $\angle BAC \cong \angle DAC$

Statements	Reasons
1. $\overline{AC} \perp \overline{BD}$; $\overline{AB} \cong \overline{AD}$	
2. $\angle ACB$ and $\angle ACD$ are right angles	
3. $\angle ACB \cong \angle ACD$	
4. $\overline{AC} \cong \overline{AC}$	
5. $\triangle ABC \cong \triangle ADC$	
6. $\angle BAC \cong \angle DAC$	

$\perp$ lines form right angles   Given   Reflexive Property   HL   ASA

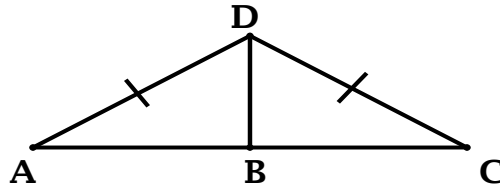Definition of right triangle   Definition of midpoint   SSS   CPCTC

Vertical angles are congruent   All right angles are congruent

Methods Of Proving Triangles Congruent: Missing Reasons

Directions: Complete each proof below by supplying the missing reasons. Be sure to mark the given information on the diagrams to assist you.
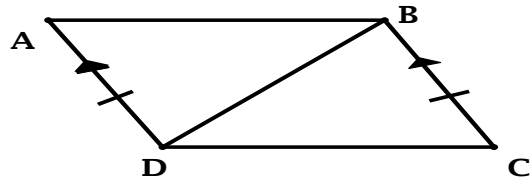
Given: B is the midpoint of $\overline{AC}$, $\overline{AD} \cong \overline{CD}$

Prove: $\triangle DAB \cong \triangle CDB$

Statements	Reasons
1. B is the midpoint of $\overline{AC}$, $\overline{AD} \cong \overline{CD}$	
2. $\overline{AB} \cong \overline{CB}$	
3. $\overline{DB} \cong \overline{DB}$	
4. $\triangle ADB \cong \triangle CDB$	

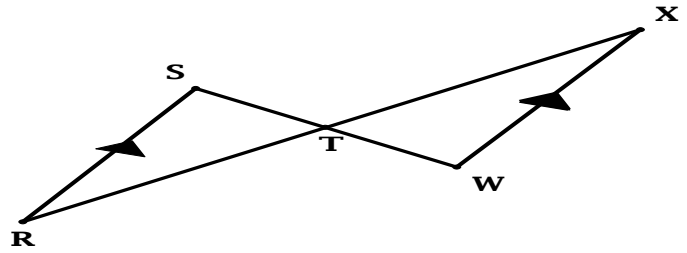**Given:** $\overline{AD} \cong \overline{CB}$; $\overline{AD} \parallel \overline{PS}$

Prove: $\triangle ADB \cong \triangle CBD$

Statements	Reasons
1. $\overline{AD} \cong \overline{CB}$; $\overline{AD} \parallel \overline{PS}$	
2. $\angle ADB \cong \angle CBD$	
3. $\overline{DB} \cong \overline{DB}$	
4. $\triangle ADB \cong \triangle CBD$	

Given: T is the midpoint of $\overline{SW}$;
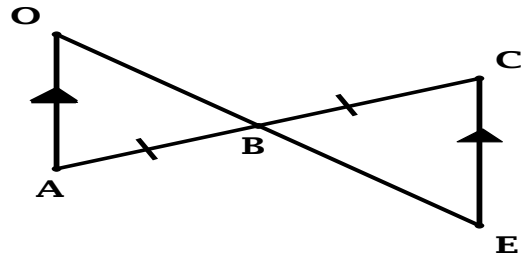 $\overline{SR} \parallel \overline{WX}$

Prove: $\triangle SRT \cong \triangle WXT$

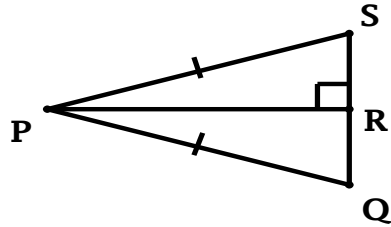| Statements	Reasons
1. T is the midpoint of $\overline{SW}$; $\overline{SR} \parallel \overline{WX}$	
2. $\overline{ST} \cong \overline{WT}$	
3. $\angle SRT \cong \angle WXT$	
4. $\angle RTS \cong \angle XTW$	
5. $\triangle SRT \cong \triangle WXT$	

Given: $\overline{OA} \parallel \overline{CE}$; $\overline{AB} \cong \overline{CB}$

Prove: $\triangle AOB \cong \triangle CEB$

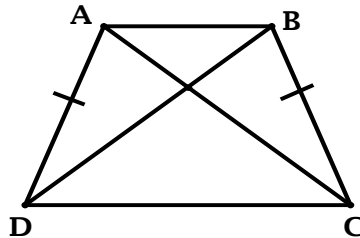| Statements	Reasons
1. $\overline{OA} \parallel \overline{CE}$; $\overline{AB} \cong \overline{CB}$	
2. $\angle OAB \cong \angle CEB$	
3. $\angle ABO \cong \angle CBE$	
4. $\triangle AOB \cong \triangle CEB$	

Given: $\overline{PR} \perp \overline{SQ}$; $\overline{PQ} \cong \overline{PS}$

Prove: $\triangle PRQ \cong \triangle PRS$

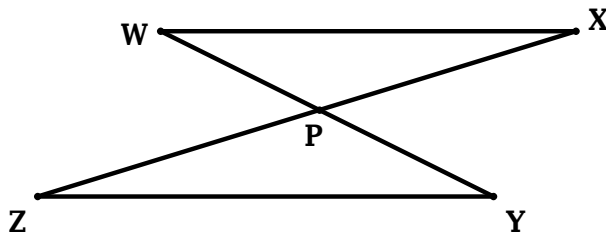| Statements	Reasons
1. $\overline{PR} \perp \overline{SQ}$	
2. $\angle PRQ$ and $\angle PRS$ are right angles	
3. $\triangle PRQ$ and $\triangle PRS$ are right triangles	
4. $\overline{PQ} \cong \overline{PS}$	
5. $\overline{PR} \cong \overline{PR}$	
6. $\triangle PRQ \cong \triangle PRS$	

Given: $\overline{BC} \cong \overline{AD}$; $\overline{BD} \cong \overline{AC}$

Prove: $\angle BAC \cong \angle ABD$

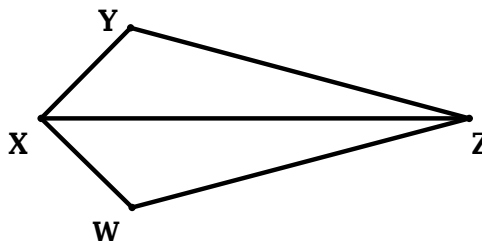| Statements	Reasons
1. $\overline{BC} \cong \overline{AD}$; $\overline{BD} \cong \overline{AC}$	
2. $\overline{AB} \cong \overline{BA}$	
3. $\triangle BAD \cong \triangle ABC$	
4. $\angle BAC \cong \angle ABD$	

Given: WY and XZ bisect each other at P

Prove: $\triangle WPX \cong \triangle YPZ$

Statements	Reasons
1: WY and XZ bisect each other at P	
2. $\overline{WP} \cong \overline{YP}$; $\overline{XP} \cong \overline{ZP}$	
3. $\angle ADB \cong \angle CBD$	
4. $\triangle WPX \cong \triangle YPZ$	

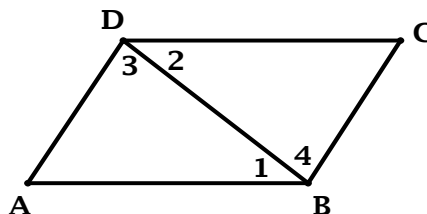**Given:** $\overline{XZ}$ bisects $\angle YXW$ and $\angle YZW$

Prove: $\triangle XYZ \cong \triangle XWZ$

Statements	Reasons
1. $\overline{XZ}$ bisects $\angle YXW$ and $\angle YZW$	
2. $\angle YXZ \cong \angle WXZ$	
3. $\angle YZX \cong \angle WZX$	
4. $\overline{XZ} \cong \overline{XZ}$	
5. $\triangle XYZ \cong \triangle XWZ$	

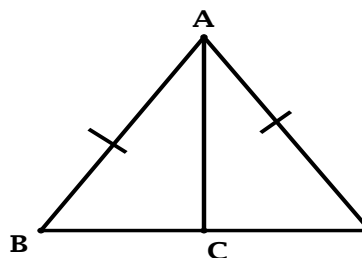**Given:** $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$

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

Statements	Reasons
1. $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$	
2. $\overline{DB} \cong \overline{DB}$	
3. $\triangle ABD \cong \triangle CDB$	
4. $\overline{AB} \cong \overline{CD}$	

Given: $\overline{AC} \perp \overline{BD}$; $\overline{AB} \cong \overline{AD}$

Prove: $\angle BAC \cong \angle DAC$

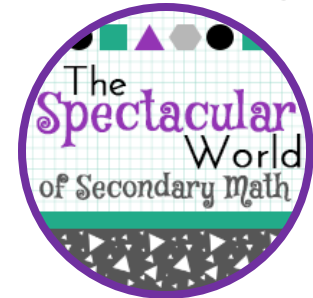| Statements	Reasons
1. $\overline{AC} \perp \overline{BD}$; $\overline{AB} \cong \overline{AD}$	
2. $\angle ACB$ and $\angle ACD$ are right angles	
3. $\angle ACB \cong \angle ACD$	
4. $\overline{AC} \cong \overline{AC}$	
5. $\triangle ABC \cong \triangle ADC$	
6. $\angle BAC \cong \angle DAC$	

Thank You For Your Purchase!

Visit My Store:

E-mail me:

Visit My Blog:

Secondary Math Shop

The Spectacular World of Secondary Math

Visit Me on Facebook:

Follow Me on Twitter:

Visit Me on Pinterest: