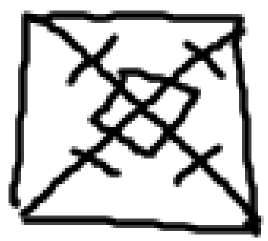
1. State whether you agree or disagree with the following statements. Justify your answers.

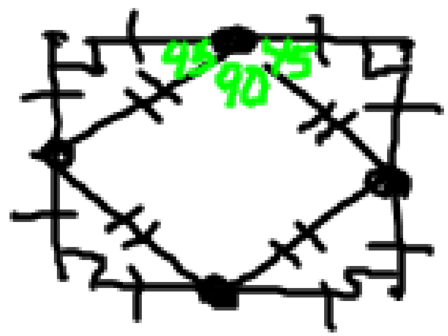
   a. The diagonals of a square separate the square into four congruent isosceles right triangles.



yes, both diag are $\perp$ & $\cong$

   b. If the midpoints of the sides of a square are connected in order, another square is formed.

yes

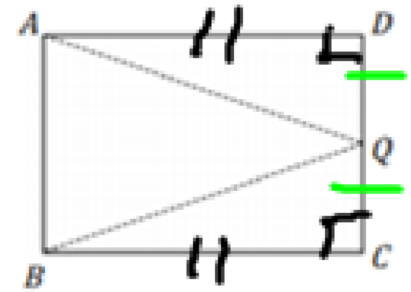


All sides & <'s are $\cong$

4. Complete the following proof.

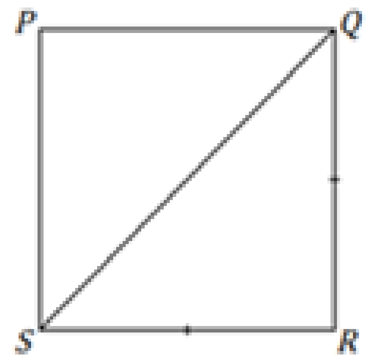
Given: $ABCD$ is a rectangle and Q is the midpoint of $\overline{CD}$.

Prove: $\overline{AQ} \cong \overline{BQ}$



Statements	Reasons
1. $ABCD$ is a rectangle and Q is the midpoint of $\overline{CD}$.	1. Given
2. $\overline{DQ} \cong \overline{QC}$	2. Def of a midpoint
3. $\overline{AD} \cong \overline{BC}$	3. In a rectangle, opposite sides are congruent.
4. $\angle D \cong \angle C$	4. All Rt <'s are $\cong$
5. $\triangle ADQ \cong \triangle BCQ$	5. SAS
6. $\overline{AQ} \cong \overline{BQ}$	6. CPCTC

2. Complete the following proof.



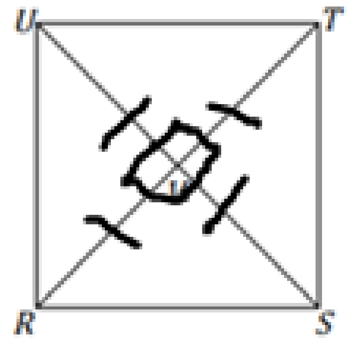
Given: $PQRS$ is a square.

Prove: $\overline{PR} \cong \overline{QS}$

Statements	Reasons
1. $PQRS$ is a square.	**1.** Given
2. $\overline{PQ} \cong \overline{QR} \cong \overline{SR} \cong \overline{PS}$	**2.** Definition of a square: All sides are congruent
3. $\angle P \cong \angle Q \cong \angle R \cong \angle S$	**3.** All Rt <'s $\cong$
4. $m\angle P = m\angle Q = m\angle R = m\angle S$	**4.** Definition of congruence
5. $90° = m\angle Q = m\angle R = m\angle S$	**5.** Substitution
6. $m\angle P = 90°$	**6.** Substitution
7. $\triangle PQS \cong \triangle RSQ$	**7.** SAS
8. $\overline{PR} \cong \overline{QS}$	**8.** CPCTC

3. Complete the following proof.

Given: $\overline{RT} \cong \overline{SU}$
$\overline{US}$ is the perpendicular bisector of $\overline{RT}$.
$\overline{RT}$ is the perpendicular bisector of $\overline{US}$.



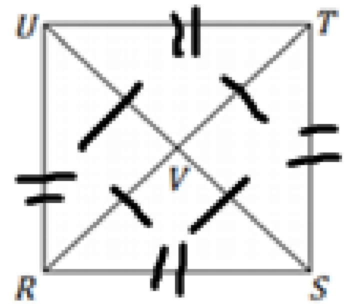
Prove: $RSTU$ is a square.

Statements	**Reasons**
1. $\overline{RT} \cong \overline{SU}$ $\overline{US}$ is the perpendicular bisector of $\overline{RT}$. $\overline{RT}$ is the perpendicular bisector of $\overline{US}$.	**1.** Given
2. $\overline{UV} \cong \overline{TV} \cong \overline{SV} \cong \overline{RV}$ $\angle UVR$, $\angle RVS$, $\angle SVT$, $\angle TVU$ are Rt $\angle$s	**2.** Definition of perpendicular bisector
3. $m\angle UVR = m\angle RVS = m\angle SVT = m\angle TVU = 90°$	**3.** Def of Rt $\angle$
4. $\angle UVR \cong \angle RVS \cong \angle SVT \cong \angle TVU$	**4.** All Rt $\angle$'s are $\cong$
5. $\triangle UVR \cong \triangle RVS \cong \triangle SVT \cong \triangle TVU$	**5.** SAS
6. $\overline{UT} \cong \overline{TS} \cong \overline{RS} \cong \overline{RU}$	**6.** CPCTC
7. $RSTU$ is a square.	**7.** Def of a square

2. Consider the two-column proof below. Put the statements and reasons in the correct order by writing the correct number in the left column.

Given: $RSTU$ is a square.

Prove: $\overline{RT} \perp \overline{SU}$

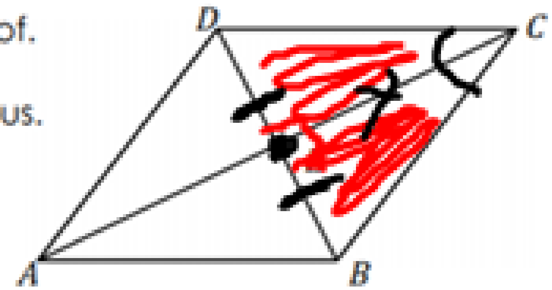


	Statements	Reasons
3	$\overline{UV} \cong \overline{SV} \cong \overline{RV} \cong \overline{TV}$	In a square, diagonals are congruent and bisect each other.
8	$\overline{RT} \perp \overline{SU}$	Definition of bisector
6	$m\angle UVR + m\angle TVU = 180°$ $m\angle RVS + m\angle TVS = 180°$	Linear Pairs
2	$\overline{UT} \cong \overline{TS} \cong \overline{RS} \cong \overline{UR}$	Definition of a square
7	$m\angle UVR = m\angle TVU = m\angle RVS = m\angle TVS = 90°$	Substitution
4	$\Delta UVR \cong \Delta RVS \cong \Delta SVT \cong \Delta TVU$	SSS
1	$RSTU$ is a square.	Given
5	$\angle UVR \cong \angle TVU \cong \angle RVS \cong \angle TVS$	CPCTC

5. Complete following proof.

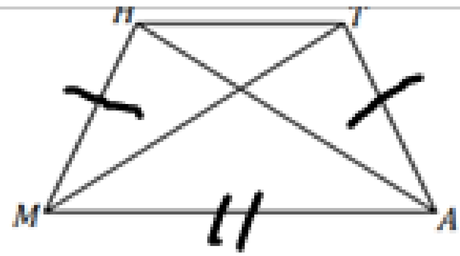
Given: $ABCD$ is a rhombus.

Prove: $\overline{AC}$ bisects $\angle DCB$ of the rhombus.



Statements	Reasons
1. $ABCD$ is a rhombus.	1. Given
2. $\overline{DB} \perp \overline{AC}$	2. Diagonals of a rhombus are perpendicular
3. $\angle CED$ & $\angle CEB$ are Rt $\angle$'s	3. Definition of perpendicular lines
4. $\angle DEC \cong \angle BEC$	4. All Rt $\angle$'s are $\cong$
5. $\overline{DE} \cong \overline{BE}$	5. Diag bisect ea. other
6. $\overline{CE} \cong \overline{CE}$	6. Reflexive Property
7. $\Delta DEC \cong \Delta BEC$	7. SAS
8. $\angle ECB \cong \angle DCE$	8. CPCTC
9. $\overline{AC}$ bisects $\angle DCB$ of the rhombus.	9. Definition of an angle bisector

1. Complete the following proof.



Given: $MATH$ is an isosceles trapezoid.
Prove: $\angle MHA \cong \angle ATM$

Complete the paragraph proof using the bank of terms below.

It is given that $MATH$ is an isosceles trapezoid. We can prove that $\overline{MH} \cong \overline{AT}$ Def of Is. Trap. Then, $\overline{MA} \cong \overline{MA}$ by the Reflexive. We can state that $\overline{AH} \cong \overline{MT}$ by using the Trap Diag theorem. Now, we have triangles $\Delta HMA \cong \Delta TAM$ by SSS. Finally, by using CPCTC, we can prove that $\angle MHA \cong \angle ATM$.

~~Reflexive Property~~	Midsegment Theorem for Trapezoids
Trapezoid Base Angles Theorem	~~Definition of Isosceles Trapezoid~~
ASA	~~SSS~~
~~Trapezoid Diagonals Theorem~~	Transitive Property
Alternate Interior Angles	~~CPCTC~~