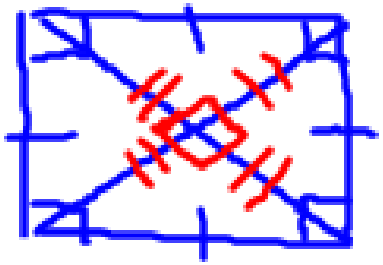
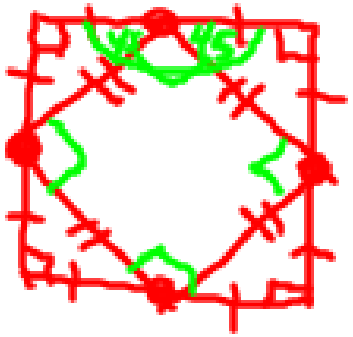
1. State whether you agree or disagree with the following statements. Justify your answers.

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



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

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

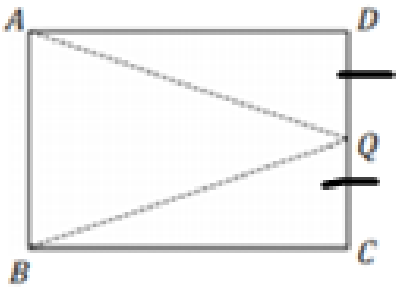


yes, all sides & $\angle$'s are $\cong$

4. Complete the following proof.

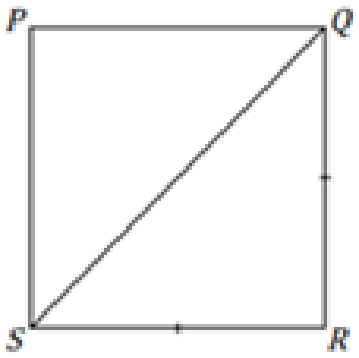
Given: $ABCD$ is a rectangle and Q is the midpoint of $\overline{CD}$.

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 midpt
3. $\overline{AD} \cong \overline{BC}$	3. In a rectangle, opposite sides are congruent.
4. $\angle D \cong \angle C$	4. All Rt $\angle$'s are $\cong$
5. $\triangle ADQ \cong \triangle BCQ$	5. SAS
6. $\overline{AQ} \cong \overline{BQ}$	6. CPCTC

2. Complete the following proof.

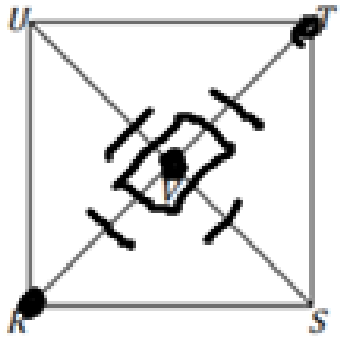


Given: $PQRS$ is a square.

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

Statements	Reasons
1. $PQRS$ is a square.	**1.** Given
2. $\overline{PS} \cong \overline{SR} \cong \overline{QR} \cong \overline{PQ}$	**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 are ≅
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. $\triangle QPS \cong \triangle SRQ$	**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 a Rt $\angle$'s
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