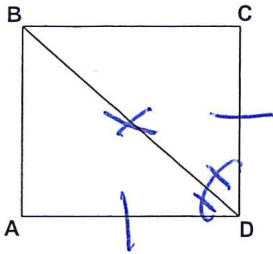


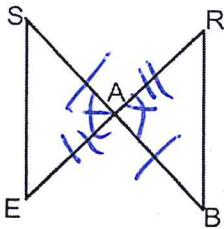
### Triangle Proofs Practice

1. Given:  $\overline{BD}$  bisects  $\angle CDA$   
 $\overline{AD} \cong \overline{DC}$   
Prove:  $\overline{BA} \cong \overline{BC}$



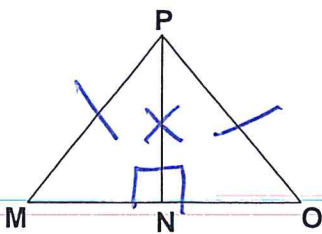
Statements	Reasons
① $\overline{BD}$ bisects $\angle CDA$	① given
② $\angle CDB \cong \angle ADB$	② An angle bisector creates two congruent angles.
③ $\overline{AD} \cong \overline{DC}$	③ given
④ $\overline{BD} \cong \overline{BD}$	④ Reflexive Property
⑤ $\triangle BDA \cong \triangle BDC$	⑤ SAS
⑥ $\overline{BA} \cong \overline{BC}$	⑥ CPCTE

2. Given:  $\overline{SB}$  and  $\overline{RE}$  bisect each other  
Prove:  $\overline{SE} \cong \overline{RB}$



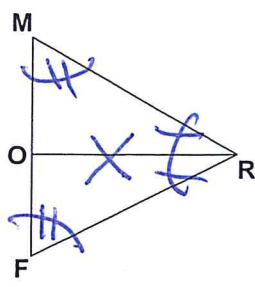
Statements	Reasons
① $\overline{SB}$ and $\overline{RE}$ bisect each other	① given
② $\overline{SA} \cong \overline{EA}$ , $\overline{EA} \cong \overline{AR}$	② A line bisector creates two congruent segments
③ $\angle SAE \cong \angle RAB$	③ Vertical angles are congruent
④ $\triangle SAE \cong \triangle RAB$	④ SAS
⑤ $\overline{SE} \cong \overline{RB}$	⑤ CPCTE

3. Given:  $\overline{PN} \perp \overline{MO}$   
 $\overline{PM} \cong \overline{PO}$   
Prove:  $\angle PMN \cong \angle PON$



Statements	Reasons
① $\overline{PN} \perp \overline{MO}$	① given
② $\angle PNM \cong \angle PNO$	② perpendicular lines create two congruent right angles.
③ $\overline{PM} \cong \overline{PO}$	③ given
④ $\overline{PN} \cong \overline{PN}$	④ reflexive property
⑤ $\triangle PNM \cong \triangle PNO$	⑤ HL
⑥ $\angle PMN \cong \angle PON$	⑥ CPCTE

4. Given:  $\overline{OR}$  bisects  $\angle FRM$   
 $\angle F \cong \angle M$   
 Prove:  $\triangle MOR \cong \triangle FOR$



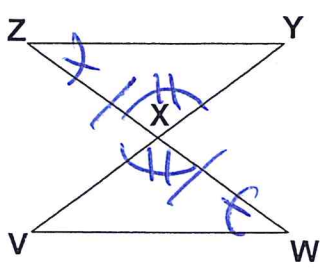
Statements

- ①  $\overline{OR}$  bisects  $\angle FRM$
- ②  $\angle FRO \cong \angle MRO$
- ③  $\angle F \cong \angle M$
- ④  $\overline{RO} \cong \overline{RO}$
- ⑤  $\triangle MOR \cong \triangle FOR$

Reasons

- ① Given
- ② An angle bisector creates two congruent angles
- ③ Given
- ④ reflexive property
- ⑤ AAS

5. Given: X is midpoint of  $\overline{WZ}$   
 $\angle W \cong \angle Z$   
 Prove:  $\angle V \cong \angle Y$



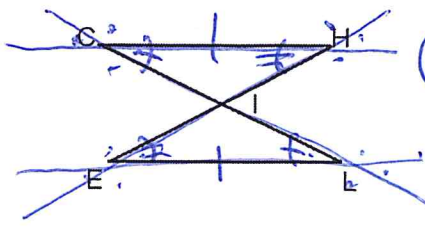
Statements

- ① X is midpoint of  $\overline{WZ}$
- ②  $\overline{ZX} \cong \overline{XW}$
- ③  $\angle W \cong \angle Z$
- ④  $\angle ZXY \cong \angle WXV$
- ⑤  $\triangle YZX \cong \triangle WXV$
- ⑥  $\angle V \cong \angle Y$

Reasons

- ① Given
- ② A midpoint creates two congruent segments
- ③ Given
- ④ Vertical angles are congruent
- ⑤ ASA
- ⑥ CPCTC

6. Given:  $\overline{CH} \parallel \overline{LE}$  and  $\overline{CH} \cong \overline{LE}$   
 Prove  $\overline{CI} \cong \overline{IL}$



Statements

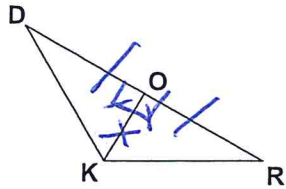
- ①  $\overline{CH} \parallel \overline{LE}$
- ②  $\angle CHI \cong \angle LIE$   
 $\angle CHE \cong \angle LEL$
- ③  $\overline{CH} \cong \overline{LE}$
- ④  $\triangle CHI \cong \triangle LEL$
- ⑤  $\overline{CI} \cong \overline{IL}$

Reasons

- ① Given
- ② Parallel lines cut by a transversal create congruent alternate interior angles
- ③ Given
- ④ ASA
- ⑤ CPCTC



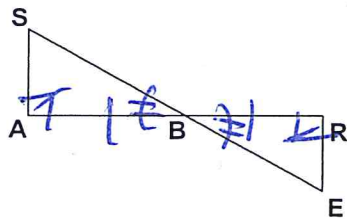
7. Given:  $\overline{KO}$  is the perpendicular bisector of  $\overline{DR}$   
 Prove:  $\angle DKO \cong \angle RKO$



- statements
- ①  $\overline{KO}$  is the perpendicular bisector of  $\overline{DR}$
  - ②  $\overline{DO} \cong \overline{OR}$
  - ③  $\angle DOK \cong \angle ROK$
  - ④  $\overline{KO} \cong \overline{KO}$
  - ⑤  $\triangle DKO \cong \triangle RKO$
  - ⑥  $\angle DKO \cong \angle RKO$

- Reasons
- ① Given
  - ② A line bisector creates two congruent segments
  - ③ Perpendicular lines create two congruent right angles
  - ④ Reflexive Property
  - ⑤ SAS
  - ⑥ CPCTC

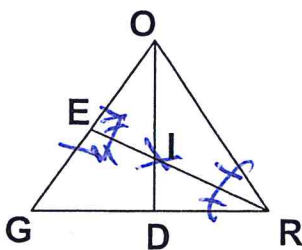
8. Given:  $\overline{SA} \perp \overline{AR}$ ,  $\overline{AR} \perp \overline{RE}$ , B is the midpoint of  $\overline{AR}$   
 Prove:  $\triangle SAB \cong \triangle ERB$



- statements
- ①  $\overline{SA} \perp \overline{AR}$ ,  $\overline{AR} \perp \overline{RE}$
  - ②  $\angle SBA \cong \angle ERB$
  - ③ B is the midpoint of  $\overline{AR}$
  - ④  $\overline{AB} \cong \overline{BR}$
  - ⑤  $\angle SBA \cong \angle ERB$
  - ⑥  $\triangle SAB \cong \triangle ERB$

- Reasons
- ① Given
  - ② Perpendicular lines create two congruent right angles.
  - ③ B midpoint given
  - ④ A midpoint creates two congruent segments
  - ⑤ Vertical angles are congruent
  - ⑥ ASA

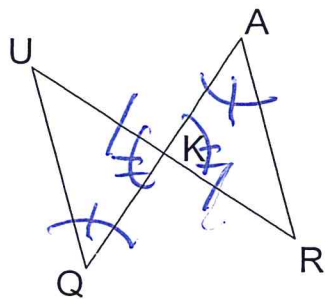
9. Given:  $\overline{ER}$  bisects  $\angle ORG$ ,  $\overline{ER}$  is an altitude  
 Prove:  $\triangle ORE \cong \triangle GRE$



- statements
- ①  $\overline{ER}$  bisects  $\angle ORG$
  - ②  $\angle ORE \cong \angle GRE$
  - ③  $\overline{ER}$  is an altitude
  - ④  $\angle ORE \cong \angle GRE$
  - ⑤  $\overline{ER} \cong \overline{ER}$
  - ⑥  $\triangle ORE \cong \triangle GRE$

- Reasons
- ① Given
  - ② An angle bisector creates two congruent angles
  - ③ Given
  - ④ An altitude creates two congruent right angles.
  - ⑤ Reflexive Property
  - ⑥ ASA

10. Given:  $\overline{QA}$  bisects  $\overline{UR}$   
 $\angle Q \cong \angle A$   
 Prove:  $\overline{QU} \cong \overline{AR}$



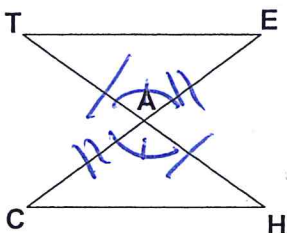
Statements

- ①  $\overline{QA}$  bisects  $\overline{UR}$
- ②  $\overline{UQ} \cong \overline{KR}$
- ③  $\angle Q \cong \angle A$
- ④  $\angle UKQ \cong \angle AKR$
- ⑤  $\triangle QUK \cong \triangle ARK$
- ⑥  $\overline{QU} \cong \overline{AR}$

Reasons

- ① given
- ② A line bisector creates two congruent segments
- ③ given
- ④ vertical angles are congruent
- ⑤ AAS
- ⑥ CPCTC

11. Given:  $\overline{TH}$  and  $\overline{CE}$  bisect each other at A  
 Prove:  $\triangle TAE \cong \triangle CAH$



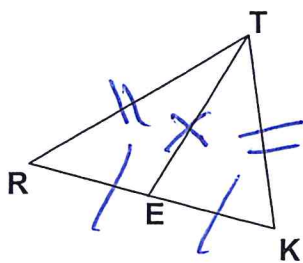
Statements

- ①  $\overline{TH}$  and  $\overline{CE}$  bisect each other at A
- ②  $\overline{TA} \cong \overline{AH}$ ,  $\overline{CA} \cong \overline{AE}$
- ③  $\angle TAE \cong \angle CAH$
- ④  $\triangle TAE \cong \triangle CAH$

Reasons

- ① given
- ② A line bisector creates two congruent segments
- ③ vertical angles are congruent.
- ④ SAS

12. Given:  $\overline{TE}$  is a median,  $\overline{TR} \cong \overline{TK}$   
 Prove:  $\angle RTE \cong \angle KTE$



Statements

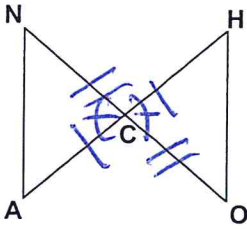
- ①  $\overline{TE}$  is a median
- ②  $\overline{RE} \cong \overline{EK}$
- ③  $\overline{TR} \cong \overline{TK}$
- ④  $\overline{TE} \cong \overline{TE}$
- ⑤  $\triangle TRE \cong \triangle TER$
- ⑥  $\angle RTE \cong \angle KTE$

Reasons

- ① given
- ② A median creates two congruent segments
- ③ given
- ④ Reflexive Property
- ⑤ SSS
- ⑥ CPCTC



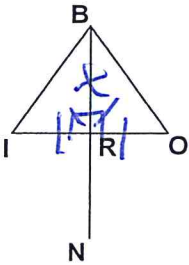
13. Given:  $\overline{NO}$  and  $\overline{HA}$  bisect each other  
 Prove:  $\angle N \cong \angle O$



- Statements
- ①  $\overline{NO}$  and  $\overline{HA}$  bisect each other
  - ②  $\overline{NC} \cong \overline{CO}$ ,  $\overline{AC} \cong \overline{CH}$
  - ③  $\angle NCA \cong \angle HCO$
  - ④  $\triangle NCA \cong \triangle OCH$
  - ⑤  $\angle N \cong \angle O$

- Reasons
- ① given
  - ② A line bisector creates two congruent segments
  - ③ vertical angles are congruent
  - ④ SAS
  - ⑤ CPCTC

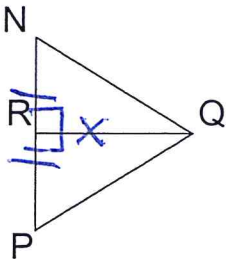
14. Given:  $\overline{NB}$  bisects  $\overline{IO}$ ,  $\overline{BR}$  is an altitude  
 Prove:  $\overline{IB} \cong \overline{OB}$



- Statements
- ①  $\overline{NB}$  bisects  $\overline{IO}$
  - ②  $\overline{IR} \cong \overline{RO}$
  - ③  $\overline{BR}$  is an altitude
  - ④  $\angle IRB \cong \angle ORB$
  - ⑤  $\overline{BR} \cong \overline{BR}$
  - ⑥  $\triangle IRB \cong \triangle ORB$
  - ⑦  $\overline{IB} \cong \overline{OB}$

- Reasons
- ① given
  - ② A line bisector creates two congruent segments
  - ③ given
  - ④ An altitude creates two congruent right angles
  - ⑤ Reflexive Property
  - ⑥ SAS
  - ⑦ CPCTC

15. Given:  $\overline{QR}$  is the perpendicular bisector of  $\overline{NP}$   
 Prove:  $\angle NQR \cong \angle PQR$



- Statements
- ①  $\overline{QR}$  is the perpendicular bisector of  $\overline{NP}$
  - ②  $\overline{NR} \cong \overline{RP}$
  - ③  $\angle NRQ \cong \angle PRQ$
  - ④  $\overline{QR} \cong \overline{QR}$
  - ⑤  $\triangle QRN \cong \triangle QRP$
  - ⑥  $\angle NQR \cong \angle PQR$

- Reasons
- ① given
  - ② A line bisector creates two congruent segments
  - ③ Perpendicular lines create two congruent right angles
  - ④ Reflexive Property
  - ⑤ SAS
  - ⑥ SAS

