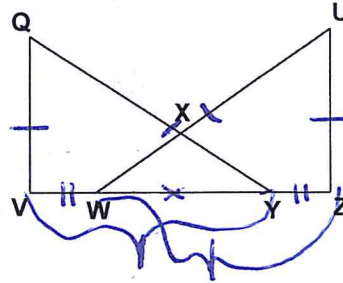


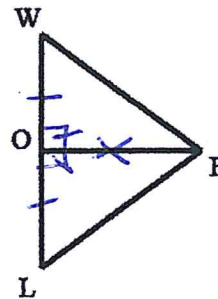
Triangle Proofs with Additional Tools

1. Given: $\overline{QV} \cong \overline{UZ}$, $\overline{VW} \cong \overline{YZ}$, $\overline{YQ} \cong \overline{WU}$
Prove: $\angle Q \cong \angle U$



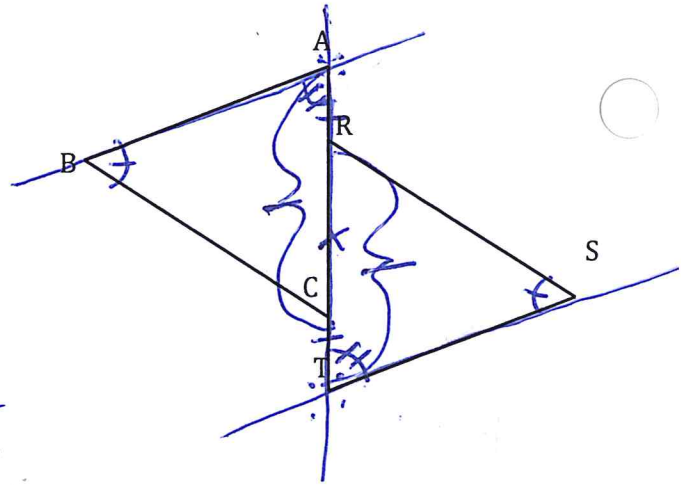
Statements	Reasons
① $\overline{QV} \cong \overline{UZ}$	① given
② $\overline{VW} \cong \overline{YZ}$	② given
③ $\overline{WY} \cong \overline{WY}$	③ reflexive property
④ $\overline{VY} \cong \overline{WZ}$	④ Addition Property
⑤ $\overline{YQ} \cong \overline{WU}$	⑤ given
⑥ $\triangle QVY \cong \triangle UZW$	⑥ SSS \cong SSS
⑦ $\angle Q \cong \angle U$	⑦ CPCTC

2. Given: \overline{OF} is the perpendicular bisector of \overline{WL}
Prove: $\triangle WFL$ is isosceles



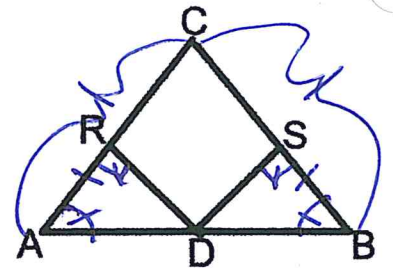
Statements	Reasons
① \overline{OF} is the perpendicular bisector of \overline{WL}	① given
② $\angle FOW \cong \angle FOL$	② perpendicular lines create two congruent right angles
③ $\overline{OW} \cong \overline{OL}$	③ A line bisector creates two congruent segments
④ $\overline{OF} \cong \overline{OF}$	④ Reflexive Property
⑤ $\triangle FOW \cong \triangle FOL$	⑤ SAS \cong SAS
⑥ $\overline{FW} \cong \overline{FL}$	⑥ CPCTC CPCTC
⑦ $\triangle WFL$ is isosceles	⑦ Isosceles Triangle Theorem

3. Given: $\angle B \cong \angle S$, $\overline{AB} \parallel \overline{ST}$, $\overline{AR} \cong \overline{TC}$
 Prove: $\overline{BC} \cong \overline{SR}$



Statements	Reasons
① $\angle B \cong \angle S$	① given
② $\overline{AB} \parallel \overline{ST}$	② given
③ $\angle BAC \cong \angle STR$	③ Parallel lines create two congruent alternate interior angles
④ $\overline{AR} \cong \overline{TC}$	④ given
⑤ $\overline{RC} \cong \overline{RC}$	⑤ Reflexive Property
⑥ $\overline{AC} \cong \overline{RT}$	⑥ Addition Property
⑦ $\triangle ABC \cong \triangle TSR$	⑦ AAS \cong AAS
⑧ $\overline{BC} \cong \overline{SR}$	⑧ CPCTC

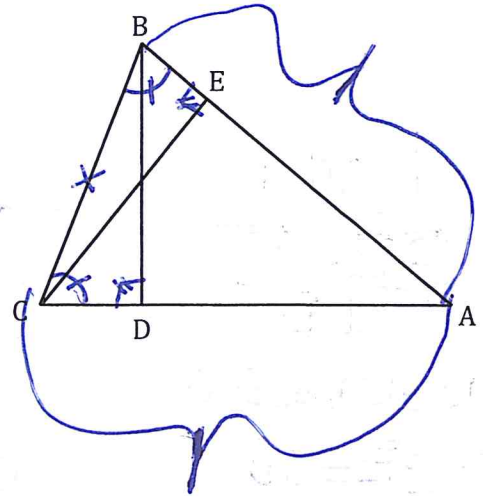
4. Given: In $\triangle ABC$, $\overline{CA} \cong \overline{CB}$, $\overline{AR} \cong \overline{BS}$, $\overline{DR} \perp \overline{AC}$, and $\overline{DS} \perp \overline{BC}$
 Prove: $\overline{DR} \cong \overline{DS}$



Statements	Reasons
① $\overline{CA} \cong \overline{CB}$	① given
② $\angle RAD \cong \angle SBD$	② Isosceles Triangle Theorem
③ $\overline{AR} \cong \overline{BS}$	③ given
④ $\overline{DR} \perp \overline{AC}$ $\overline{DS} \perp \overline{BC}$	④ given
⑤ $\angle DRA \cong \angle DSB$	⑤ perpendicular lines create two congruent right angles
⑥ $\triangle DRA \cong \triangle DSB$	⑥ ASA \cong ASA
⑦ $\overline{DR} \cong \overline{DS}$	⑦ CPCTC

5. Given: $\overline{AB} \cong \overline{AC}$, $\overline{CE} \perp \overline{AB}$, $\overline{BD} \perp \overline{AC}$

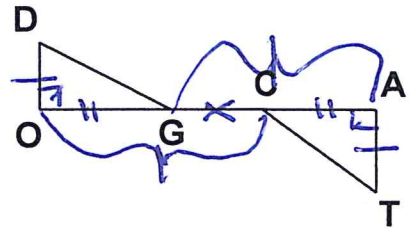
Prove: $\overline{CE} \cong \overline{BD}$



Statements	Reasons
① $\overline{AB} \cong \overline{AC}$	① given
② $\angle ABC \cong \angle ACB$	② Isosceles Triangle Theorem
③ $\overline{CE} \perp \overline{AB}$ $\overline{BD} \perp \overline{AC}$	③ given
④ $\angle BEC \cong \angle BDC$	④ Perpendicular lines create two congruent right angles
⑤ $\overline{BC} \cong \overline{BC}$	⑤ Reflexive Property
⑥ $\triangle BEC \cong \triangle CDB$	⑥ AAS \cong AAS
⑦ $\overline{CE} \cong \overline{BD}$	⑦ CPCTC

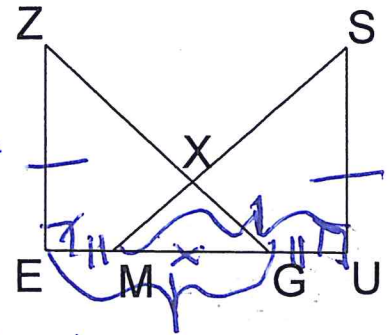
6. Given: $\overline{DO} \perp \overline{OA}$, $\overline{TA} \perp \overline{OA}$, $\overline{DO} \cong \overline{TA}$, $\overline{OC} \cong \overline{AG}$

Prove: $\overline{DG} \cong \overline{TC}$



Statements	Reasons
① $\overline{DO} \perp \overline{OA}$ $\overline{TA} \perp \overline{OA}$	① given
② $\angle DOG \cong \angle CAT$	② perpendicular lines create two congruent right angles
③ $\overline{DO} \cong \overline{TA}$	③ given
④ $\overline{OC} \cong \overline{AG}$	④ given
⑤ $\overline{OG} \cong \overline{GC}$	⑤ reflexive property
⑥ $\overline{OG} \cong \overline{GC}$	⑥ subtraction property
⑦ $\triangle DOG \cong \triangle CAT$	⑦ SAS \cong SAS
⑧ $\overline{DG} \cong \overline{TC}$	⑧ CPCTC

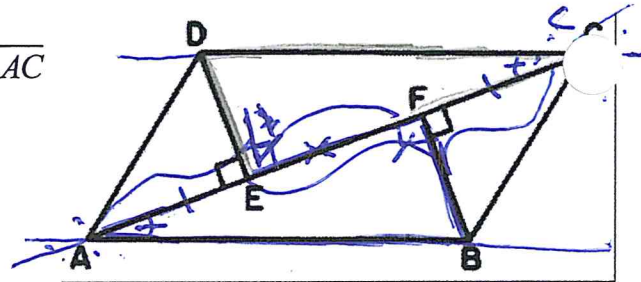
7. Given: $\overline{ZE} \perp \overline{EU}$, $\overline{SU} \perp \overline{EU}$, $\overline{ZE} \cong \overline{SU}$, $\overline{EM} \cong \overline{GU}$
 Prove: $\angle Z \cong \angle S$



- Statements
- ① $\overline{ZE} \perp \overline{EU}$
 $\overline{SU} \perp \overline{EU}$
 - ② $\angle ZEM \cong \angle SUG$
 - ③ $\overline{ZE} \cong \overline{SU}$
 - ④ $\overline{EM} \cong \overline{GU}$
 - ⑤ $\overline{ME} \cong \overline{ME}$
 - ⑥ $\overline{EG} \cong \overline{MU}$
 - ⑦ $\triangle ZEG \cong \triangle SUM$
 - ⑧ $\angle Z \cong \angle S$

- Reasons
- ① given
 - ② Perpendicular lines create two congruent right angles
 - ③ given
 - ④ given
 - ⑤ reflexive property
 - ⑥ addition property
 - ⑦ SAS \cong SAS
 - ⑧ CPCTC

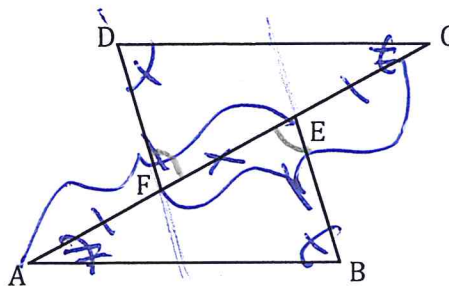
8. Given: $\overline{DC} \parallel \overline{AB}$, $\overline{AE} \cong \overline{CF}$, $\overline{DE} \perp \overline{AC}$, $\overline{BF} \perp \overline{AC}$
 Prove: $\triangle ABF \cong \triangle CDE$



- Statements
- ① $\overline{DC} \parallel \overline{AB}$
 - ② $\angle FAB \cong \angle ECD$
 - ③ $\overline{AE} \cong \overline{CF}$
 - ④ $\overline{EF} \cong \overline{EF}$
 - ⑤ $\overline{AF} \cong \overline{EC}$
 - ⑥ $\overline{DE} \perp \overline{AC}$
 $\overline{BF} \perp \overline{AC}$
 - ⑦ $\angle DEF \cong \angle BFA$
 - ⑧ $\triangle ABF \cong \triangle CDE$

- Reasons
- ① given
 - ② Parallel lines create two congruent alternate interior angles
 - ③ given
 - ④ reflexive property
 - ⑤ Addition property
 - ⑥ given
 - ⑦ Perpendicular lines create two congruent right angles
 - ⑧ ASA \cong ASA

9. Given: $\angle D \cong \angle B$, $\overline{AF} \cong \overline{CE}$, and $\angle A \cong \angle C$
 Prove: $\overline{DF} \parallel \overline{BE}$



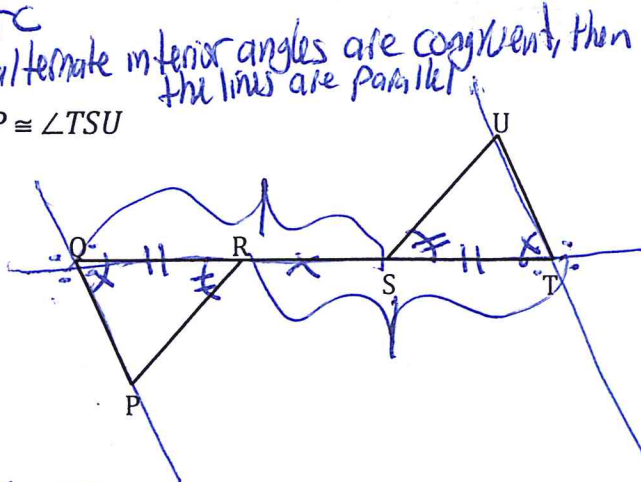
statements

Reasons

- ① $\angle D \cong \angle B$
- ② $\overline{AF} \cong \overline{CE}$
- ③ $\overline{FE} \cong \overline{FE}$
- ④ $\overline{AE} \cong \overline{FC}$
- ⑤ $\angle A \cong \angle C$
- ⑥ $\triangle CDF \cong \triangle ABE$
- ⑦ $\angle DFE \cong \angle BEA$
- ⑧ $\overline{DF} \parallel \overline{BE}$

- ① given
- ② given
- ③ Reflexive Property
- ④ Addition Property
- ⑤ given
- ⑥ AAS \cong AAS
- ⑦ CPCTC
- ⑧ IF alternate interior angles are congruent, then the lines are parallel

10. Given: $\overline{PQ} \parallel \overline{TU}$, $\overline{QS} \cong \overline{TR}$, and $\angle QRP \cong \angle TSU$
 Prove: $\overline{PR} \cong \overline{US}$



statements

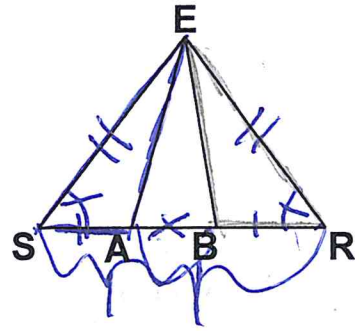
Reasons

- ① $\overline{PQ} \parallel \overline{TU}$
- ② $\angle PQR \cong \angle TUS$
- ③ $\overline{QS} \cong \overline{TR}$
- ④ $\overline{RS} \cong \overline{RS}$
- ⑤ $\overline{QR} \cong \overline{ST}$
- ⑥ $\angle QRP \cong \angle TSU$
- ⑦ $\triangle PQR \cong \triangle TUS$
- ⑧ $\overline{PR} \cong \overline{US}$

- ① given
- ② Parallel lines create two congruent alternate interior angles
- ③ given
- ④ Reflexive Property
- ⑤ subtraction property
- ⑥ given
- ⑦ ASA \cong ASA
- ⑧ CPCTC

11. Given: $\overline{SB} \cong \overline{AR}$, $\overline{ES} \cong \overline{ER}$

Prove: $\triangle SEA \cong \triangle REB$



statements

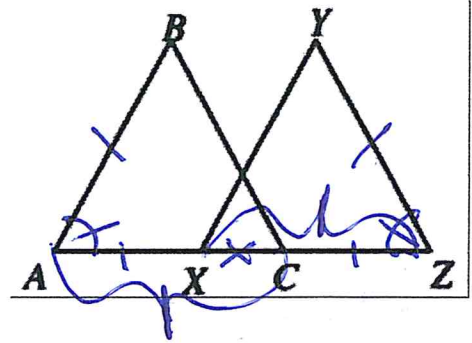
Reasons

- ① $\overline{SB} \cong \overline{AR}$
- ② $\overline{AB} \cong \overline{AB}$
- ③ $\overline{SA} \cong \overline{BR}$
- ④ $\overline{ES} \cong \overline{ER}$
- ⑤ $\angle ESA \cong \angle ERB$
- ⑥ $\triangle SEA \cong \triangle REB$

- ① given
- ② reflexive property
- ③ subtraction property
- ④ given
- ⑤ Isosceles Triangle Theorem
- ⑥ SAS \cong SAS

12. Given: $\overline{AB} \cong \overline{YZ}$, $\overline{AX} \cong \overline{CZ}$, and $\angle A \cong \angle Z$

Prove: $\angle B \cong \angle Y$



statements

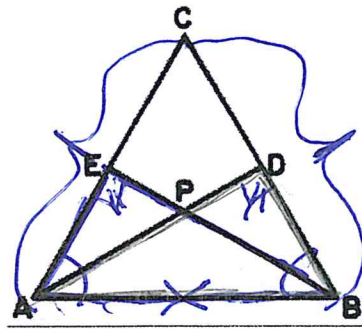
Reasons

- ① $\overline{AB} \cong \overline{YZ}$
- ② $\overline{AX} \cong \overline{CZ}$
- ③ $\overline{XC} \cong \overline{XC}$
- ④ $\overline{AC} \cong \overline{XZ}$
- ⑤ $\angle A \cong \angle Z$
- ⑥ $\triangle ABC \cong \triangle ZYX$
- ⑦ $\angle B \cong \angle Y$

- ① given
- ② given
- ③ reflexive property
- ④ Addition Property
- ⑤ given
- ⑥ SAS \cong SAS
- ⑦ CPCTC

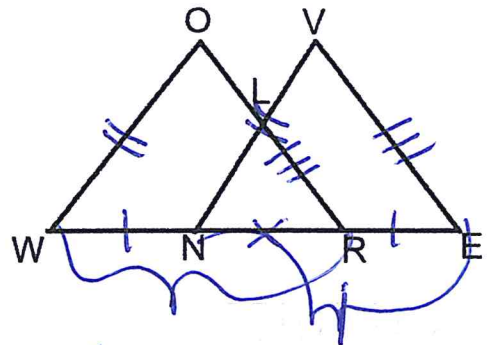
13. Given: $\overline{AC} \cong \overline{BC}$, $\overline{BE} \perp \overline{AC}$, $\overline{AD} \perp \overline{BC}$

Prove: $\triangle AEB \cong \triangle BDA$



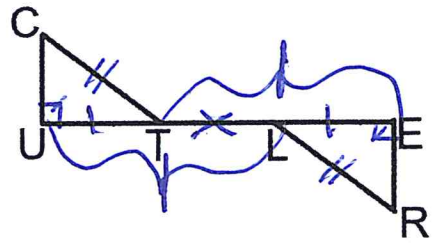
statements	Reasons
① $\overline{AC} \cong \overline{BC}$	① given
② $\angle EAB \cong \angle DBA$	② Isosceles Triangle Theorem
③ $\overline{BE} \perp \overline{AC}$ $\overline{AD} \perp \overline{BC}$	③ given
④ $\angle BEA \cong \angle ADB$	④ Perpendicular lines create congruent right angles
⑤ $\overline{AB} \cong \overline{AB}$	⑤ Reflexive Property
⑥ $\triangle AEB \cong \triangle BDA$	⑥ AAS \cong AAS

14. Given: $\overline{WN} \cong \overline{RE}$, $\overline{WO} \cong \overline{NV}$, $\overline{OR} \cong \overline{VE}$
Prove: $\angle WOR \cong \angle NVE$



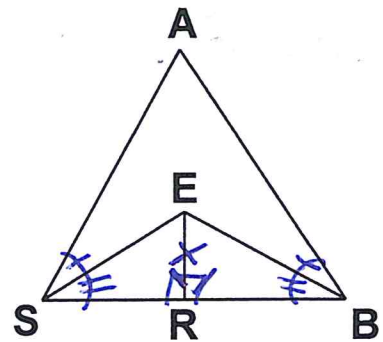
statements	Reasons
① $\overline{WN} \cong \overline{RE}$	① given
② $\overline{NR} \cong \overline{NR}$	② reflexive property
③ $\overline{WR} \cong \overline{NE}$	③ Addition Property
④ $\overline{WO} \cong \overline{NV}$	④ given
⑤ $\overline{OR} \cong \overline{VE}$	⑤ given
⑥ $\triangle WOR \cong \triangle NVE$	⑥ SSS \cong SSS
⑦ $\angle WOR \cong \angle NVE$	⑦ CPCTC

15. Given: $\overline{UL} \cong \overline{TE}$, $\overline{CU} \perp \overline{UT}$, $\overline{LE} \perp \overline{ER}$, $\overline{CT} \cong \overline{LR}$
 Prove: $\overline{CU} \cong \overline{ER}$



Statements	Reasons
① $\overline{UL} \cong \overline{TE}$	① given
② $\overline{TE} \cong \overline{TE}$	② reflexive property
③ $\overline{UT} \cong \overline{LE}$	③ subtraction property
④ $\overline{CU} \perp \overline{UT}$ $\overline{LE} \perp \overline{ER}$	④ given
⑤ $\angle CUE \cong \angle LER$	⑤ perpendicular lines create two congruent right angles
⑥ $\overline{CT} \cong \overline{LR}$	⑥ given
⑦ $\triangle CUE \cong \triangle LER$	⑦ HL \cong HL
⑧ $\overline{CU} \cong \overline{ER}$	⑧ CPCTC

16. Given: $\angle ASB \cong \angle ABS$, $\angle ASE \cong \angle ABE$, $\overline{ER} \perp \overline{SB}$
 Prove: $\angle RES \cong \angle REB$



Statements	Reasons
① $\angle ASB \cong \angle ABS$	① given
② $\angle ASE \cong \angle ABE$	② given
③ $\angle ESR \cong \angle EBR$	③ subtraction property
④ $\overline{ER} \perp \overline{SB}$	④ given
⑤ $\angle ERS \cong \angle ERB$	⑤ perpendicular lines create congruent right angles
⑥ $\overline{ER} \cong \overline{ER}$	⑥ reflexive property
⑦ $\triangle RES \cong \triangle REB$	⑦ AAS \cong AAS
⑧ $\angle RES \cong \angle REB$	