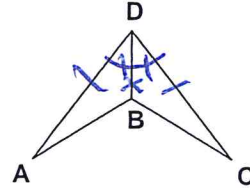


Name Schlansky
Mr. Schlansky

Date _____
Geometry

Triangle Proofs with CPCTC

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



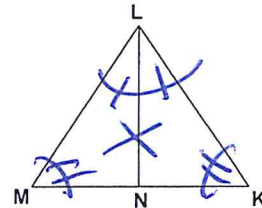
statements

Reasons

- ① \overline{BD} bisects $\angle ADC$
- ② $\angle ADB \cong \angle CDB$
- ③ $\overline{AD} \cong \overline{DC}$
- ④ $\overline{DB} \cong \overline{DB}$
- ⑤ $\triangle ADB \cong \triangle CDB$
- ⑥ $\overline{AB} \cong \overline{BC}$

- ① given
- ② An angle bisector creates two congruent angles.
- ③ given
- ④ Reflexive Property
- ⑤ SAS
- ⑥ CPCTC

2. Given: \overline{LN} bisects $\angle KLM$
 $\angle LKM \cong \angle LMK$
Prove: $\overline{NM} \cong \overline{NK}$



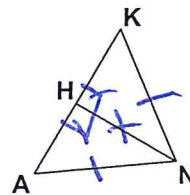
statements

Reasons

- ① \overline{LN} bisects $\angle KLM$
- ② $\angle MLN \cong \angle KLN$
- ③ $\angle LKM \cong \angle LMK$
- ④ $\overline{LN} \cong \overline{LN}$
- ⑤ $\triangle MLN \cong \triangle KLN$
- ⑥ $\overline{NM} \cong \overline{NK}$

- ① given
- ② An angle bisector creates two congruent angles.
- ③ given
- ④ Reflexive Property
- ⑤ AAS
- ⑥ CPCTC

3. Given: $\overline{HN} \perp \overline{KA}$, $\overline{KN} \cong \overline{AN}$
 Prove: $\angle HAN \cong \angle HKN$



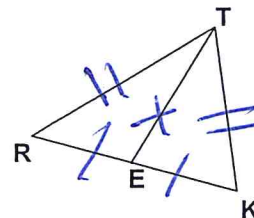
Statements

- ① $\overline{HN} \perp \overline{KA}$
- ② $\angle KHN \cong \angle AHN$
- ③ $\overline{KN} \cong \overline{AN}$
- ④ $\overline{HN} \cong \overline{HN}$
- ⑤ $\triangle HAN \cong \triangle HKN$
- ⑥ $\angle HAN \cong \angle HKN$

Reasons

- ① given
- ② Perpendicular lines create two congruent right angles.
- ③ given
- ④ Reflexive Property
- ⑤ HL
- ⑥ CPCTC

4. Given: \overline{TE} is a median, $\overline{TR} \cong \overline{TK}$
 Prove: $\angle TKR \cong \angle TRK$



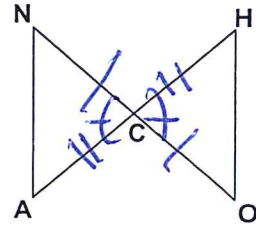
Statements

- 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 $\triangle RTE \cong \triangle KTE$
- ⑥ $\angle TKR \cong \angle TRK$

Reasons

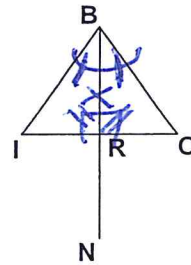
- ① given
- ② A median creates two congruent segments
- ③ given
- ④ Reflexive Property
- ⑤ SSS
- ⑥ CPCTC

5. Given: \overline{NO} and \overline{HA} bisect each other
 Prove: $\overline{NA} \cong \overline{HO}$



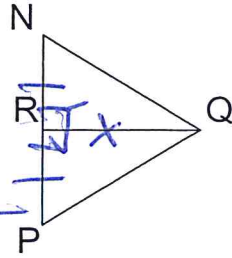
| Statements | Reasons |
|--|---|
| ① \overline{NO} and \overline{HA} bisect each other | ① given |
| ② $\overline{NC} \cong \overline{CO}$ $\overline{HC} \cong \overline{CA}$ | ② a line bisector creates two congruent segments. |
| ③ $\angle NCA \cong \angle HCO$ | ③ vertical angles are congruent |
| ④ $\triangle NCA \cong \triangle HCO$ | ④ SAS |
| ⑤ $\overline{NA} \cong \overline{HO}$ | ⑤ CPCTC |

6. Given: \overline{NB} bisects $\angle IBO$, \overline{BR} is an altitude
 Prove: $\angle BIO \cong \angle BOI$



| Statements | Reasons |
|--|---|
| ① \overline{NB} bisects $\angle IBO$ | ① given |
| ② $\angle IBR \cong \angle OBR$ | ② An angle bisector creates two congruent angles. |
| ③ \overline{BR} is an altitude | ③ given |
| ④ $\angle BRI \cong \angle BRO$ | ④ An altitude creates two congruent right angles |
| ⑤ $\overline{BR} \cong \overline{BR}$ | ⑤ Reflexive Property |
| ⑥ $\triangle BRI \cong \triangle BRO$ | ⑥ ASA |
| ⑦ $\angle BIO \cong \angle BOI$ | ⑦ CPCTC |

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



Statements

Reasons

① \overline{QR} is the perpendicular bisector of \overline{NP}

① Given

② $\overline{NR} \cong \overline{RP}$

② A line bisector creates two congruent segments

③ $\angle NRQ \cong \angle PRQ$

③ Perpendicular lines create two congruent right angles.

④ $\overline{RQ} \cong \overline{RQ}$

④ Reflexive Property

⑤ $\triangle NRQ \cong \triangle PRQ$

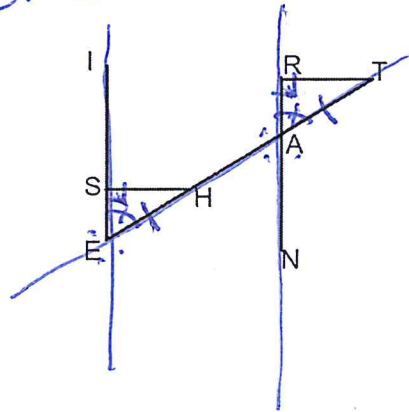
⑤ SAS

⑥ $\angle NQR \cong \angle PQR$

⑥ CPCTC

8. Given: $\overline{IE} \parallel \overline{RN}$, $\overline{TR} \perp \overline{RN}$, $\overline{HS} \perp \overline{IE}$, $\overline{EH} \cong \overline{AT}$

Prove: $\overline{SH} \cong \overline{RT}$



Statements

Reasons

① $\overline{IE} \parallel \overline{RN}$

① Given

② $\angle SEH \cong \angle RAT$

② Parallel lines cut by a transversal create congruent corresponding angles.

③ $\overline{TR} \perp \overline{RN}$, $\overline{HS} \perp \overline{IE}$

③ Given

④ $\angle TRA \cong \angle HSE$

④ Perpendicular lines create two congruent right angles.

⑤ $\overline{EH} \cong \overline{AT}$

⑤ Given

⑥ $\triangle HSE \cong \triangle TRA$

⑥ AAS

⑦ $\overline{SH} \cong \overline{RT}$

⑦ CPCTC