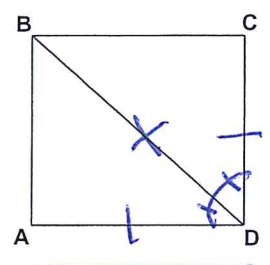


Name Schlansky
Mr. Schlansky

Date _____
Geometry

Triangle Proofs!

1. Given: \overline{BD} bisects $\angle CDA$
 $\overline{AD} \cong \overline{DC}$
Prove: $\triangle BAD \cong \triangle BCD$



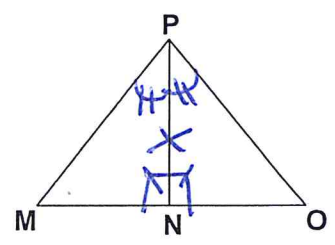
statements

Reasons

- ① \overline{BD} bisects $\angle CDA$
- ② $\angle BDC \cong \angle BDA$
- ③ $\overline{AD} \cong \overline{DC}$
- ④ $\overline{BD} \cong \overline{BD}$
- ⑤ $\triangle BAD \cong \triangle BCD$

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

2. Given: \overline{PN} is an altitude to \overline{MO}
 $\angle OPN \cong \angle MPN$
Prove: $\triangle MPN \cong \triangle OPN$



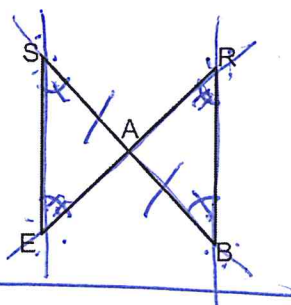
statements

Reasons

- ① \overline{PN} is an altitude to \overline{MO}
- ② $\angle PNM \cong \angle PNO$
- ③ $\angle OPN \cong \angle MPN$
- ④ $\overline{PN} \cong \overline{PN}$
- ⑤ $\triangle MPN \cong \triangle OPN$

- ① given
- ② An altitude creates two congruent right angles
- ③ given
- ④ Reflexive Property
- ⑤ ASA

3. Given: $\overline{SE} \parallel \overline{RB}$ and \overline{RE} bisects \overline{SB}
 Prove: $\triangle ESA \cong \triangle RBA$



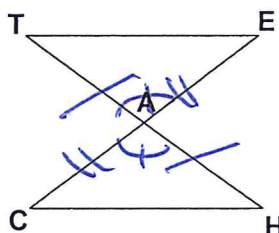
Statements

- ① $\overline{SE} \parallel \overline{RB}$
- ② $\angle SEA \cong \angle RBA$
 $\angle SEA \cong \angle ARE$
- ③ \overline{RE} bisects \overline{SB}
- ④ $\overline{SA} \cong \overline{AB}$
- ⑤ $\triangle ESA \cong \triangle RBA$

Reasons

- ① Given
- ② Parallel lines cut by a transversal create two congruent alternate interior angles.
- ③ Given
- ④ A line bisector creates two congruent segments
- ⑤ AAS

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



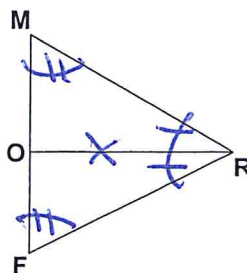
Statements

- 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

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



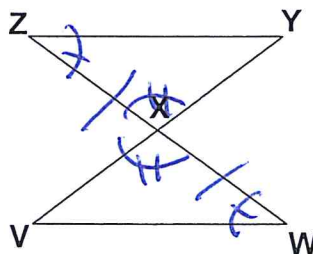
statements

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

Reasons

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

6. Given: X is midpoint of \overline{WZ}
 $\angle W \cong \angle Z$
 Prove: $\triangle WXV \cong \triangle ZXY$



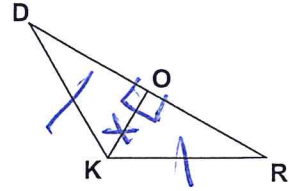
statements

- ① X is the midpoint of \overline{WZ}
- ② $\overline{WX} \cong \overline{XZ}$
- ③ $\angle W \cong \angle Z$
- ④ $\angle ZXV \cong \angle VXW$
- ⑤ $\triangle WXV \cong \triangle ZXY$

Reasons

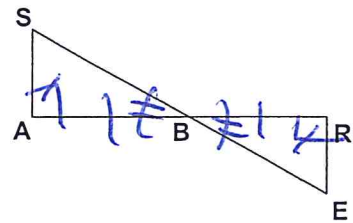
- ① given
- ② A midpoint creates two congruent segments
- ③ given
- ④ vertical angles are congruent
- ⑤ ASA

7. Given: $\overline{KO} \perp \overline{DR}$, $\overline{KD} \cong \overline{KR}$
 Prove: $\triangle ROK \cong \triangle DOK$



Statements	Reasons
① $\overline{KO} \perp \overline{DR}$	① given
② $\angle ROD \cong \angle ROR$	② perpendicular lines create two congruent right angles
③ $\overline{KD} \cong \overline{KR}$	③ given
④ $\overline{KO} \cong \overline{KO}$	④ Reflexive Property
⑤ $\triangle ROK \cong \triangle DOK$	⑤ HL

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	Reasons
① $\overline{SA} \perp \overline{AR}$, $\overline{AR} \perp \overline{RE}$	① given
② $\angle SAB \cong \angle ERB$	② perpendicular lines create two congruent right angles.
③ B is the midpoint of \overline{AR}	③ given
④ $\overline{AB} \cong \overline{BR}$	④ A midpoint creates two congruent segments
⑤ $\angle SBA \cong \angle EBR$	⑤ vertical angles are congruent
⑥ $\triangle SAB \cong \triangle ERB$	⑥ ASA