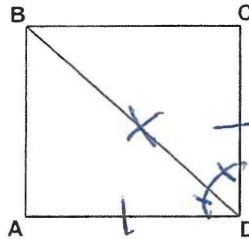


Name Schlansky
Mr. Schlansky

Date _____
Geometry

Triangle Proofs!

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



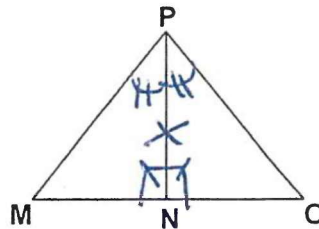
Statements

- 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 $\triangle BAD \cong \triangle BCD$

Reasons

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

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



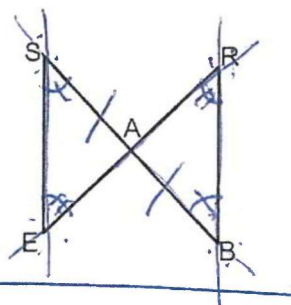
Statements

- 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 $\triangle MPN \cong \triangle OPN$

Reasons

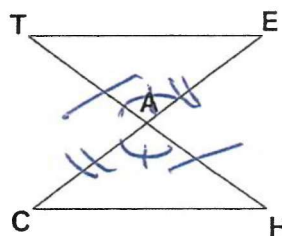
- ① given
- ② perpendicular lines create two congruent right angles
- ③ given
- ④ Reflexive Property
- ⑤ ASA $\cong$ ASA

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



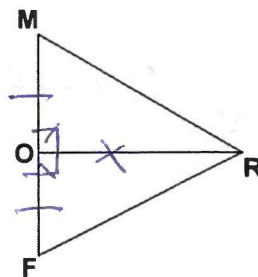
Statements	Reasons
① $\overline{SE} \parallel \overline{RB}$	① Given
② $\angle SEA \cong \angle RBA$ $\angle SEA \cong \angle ARE$	② Parallel lines cut by a transversal create two congruent alternate interior angles.
③ $\overline{RE}$ bisects $\overline{SB}$	③ Given
④ $\overline{SA} \cong \overline{AB}$	④ A line bisector creates two congruent segments
⑤ $\triangle ESA \cong \triangle RBA$	⑤ AAS

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



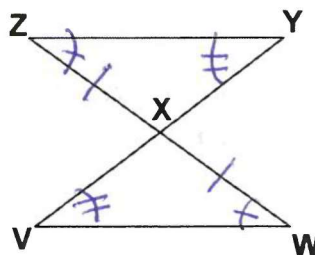
Statements	Reasons
① $\overline{TH}$ and $\overline{CE}$ bisect each other at A	① Given
② $\overline{TA} \cong \overline{AH}$ $\overline{CA} \cong \overline{AE}$	② A line bisector creates two congruent segments
③ $\angle TAE \cong \angle CAH$	③ Vertical angles are congruent
④ $\triangle TAE \cong \triangle CAH$	④ SAS

5. Given: $\overline{RO} \perp \overline{MF}$
 O is the midpoint of $\overline{MF}$
 Prove: $\triangle MOR \cong \triangle FOR$



Statements	Reasons
① $\overline{RO} \perp \overline{MF}$	① given
② $\angle MOR \cong \angle FOR$	② Perpendicular lines form congruent right angles
③ O is the midpoint of $\overline{MF}$	③ given
④ $\overline{MO} \cong \overline{OF}$	④ a midpoint creates two congruent segments
⑤ $\overline{OR} \cong \overline{OR}$	⑤ Reflexive Property
⑥ $\triangle MOR \cong \triangle FOR$	⑥ SAS $\cong$ SAS
⑦	⑦

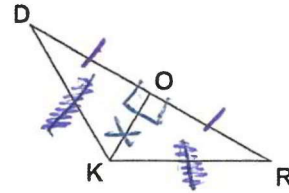
6. Given: X is midpoint of $\overline{WZ}$
 $\overline{ZY} \parallel \overline{VW}$
 Prove: $\triangle WXV \cong \triangle ZXY$



Statements	Reasons
① X is midpoint of $\overline{WZ}$	① given
② $\overline{ZX} \cong \overline{XW}$	② A midpoint creates two congruent segments
③ $\overline{ZY} \parallel \overline{VW}$	③ given
④ $\angle YZX \cong \angle VWX$ $\angle ZYX \cong \angle WVX$	④ Parallel lines cut by a transversal create congruent alternate interior angles.

$\overline{KO}$ is the perpendicular bisector of $\overline{DR}$

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



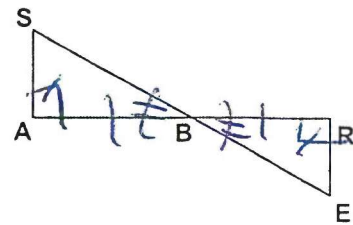
Statements

Reasons

- ① $\overline{KO}$ ~~is~~ is the perpendicular bisector of $\overline{DR}$
- ② $\angle ROD \cong \angle ROR$
- ③ ~~$\overline{KO} \cong \overline{KO}$~~ $\overline{DO} \cong \overline{RO}$
- ④ $\overline{KO} \cong \overline{KO}$
- ⑤ $\triangle ROK \cong \triangle DOK$

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

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

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