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Mr. Schlansky

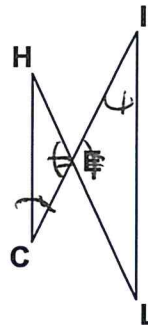
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Geometry

Proving Proportions and Multiplication

1. Given: $\angle HCE \cong \angle LIE$

Prove: $\overline{CE} \cdot \overline{IL} = \overline{CH} \cdot \overline{EI}$

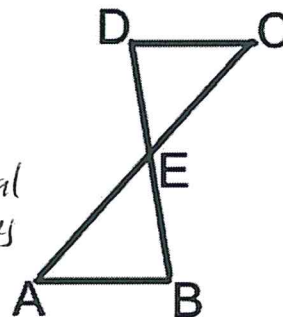
Statements	Reasons
① $\angle HCE \cong \angle LIE$	① given
② $\angle HEC \cong \angle LEI$	② vertical angles are congruent
③ $\triangle HCE \sim \triangle LIE$	③ AA \cong AA
④ $\frac{CE}{EI} = \frac{CH}{IL}$	④ CSSTIP
⑤ $\overline{CE} \cdot \overline{IL} = \overline{CH} \cdot \overline{EI}$	⑤ cross products are equal



2. Given $\overline{AB} \parallel \overline{DC}$

Prove: $\overline{DC} \cdot \overline{EB} = \overline{AB} \cdot \overline{DE}$

Statements	Reasons
① $\overline{AB} \parallel \overline{DC}$	① given
②	② parallel lines cut by a transversal create congruent alternate interior angles
③ $\triangle DCN \sim \triangle BAE$	③ AA \cong AA
④ $\frac{DC}{DE} = \frac{AB}{EB}$	④ CSSTIP
⑤ $\overline{DC} \cdot \overline{EB} = \overline{AB} \cdot \overline{DE}$	⑤ cross products are equal

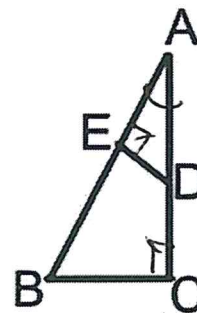


3. Given: $\overline{BC} \perp \overline{AC}$

$\overline{DE} \perp \overline{AB}$

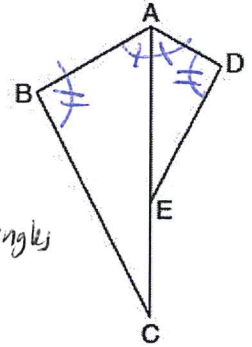
Prove: $\overline{AC} \cdot \overline{AD} = \overline{AE} \cdot \overline{AB}$

Statements	Reasons
① $\overline{BC} \perp \overline{AC}, \overline{DE} \perp \overline{AB}$	① given
② $\angle BCA \cong \angle AED$	② perpendicular lines form congruent right angles
③ $\angle A \cong \angle A$	③ Reflexive Property
④ $\triangle EAD \sim \triangle CAB$	④ AA \cong AA
⑤ $\frac{AC}{AB} = \frac{AE}{AD}$	⑤ CSSTIP
⑥ $\overline{AC} \cdot \overline{AD} = \overline{AE} \cdot \overline{AB}$	⑥ cross products are equal



4. Given: \overline{CA} bisects $\angle BAD$, $\angle ABC \cong \angle ADE$

Prove: $\overline{BC} \cdot \overline{AE} = \overline{DE} \cdot \overline{AC}$

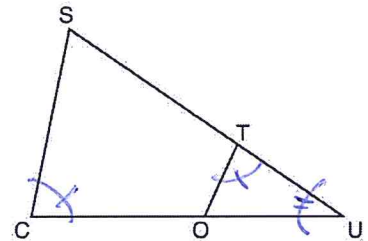


Statements	Reasons
① \overline{CA} bisects $\angle BAD$	① given
② $\angle BAC \cong \angle DAE$	② an angle bisector creates two congruent angles
③ $\angle ABC \cong \angle ADE$	③ given

④ $\triangle CBA \sim \triangle EDA$	④ AA \cong AA
⑤ $\frac{BC}{AC} = \frac{DE}{AE}$	⑤ CSSTIP
⑥ $BC \cdot \overline{AE} = \overline{DE} \cdot \overline{AC}$	⑥ cross products are equal

5. Given: $\angle C \cong \angle OTU$.

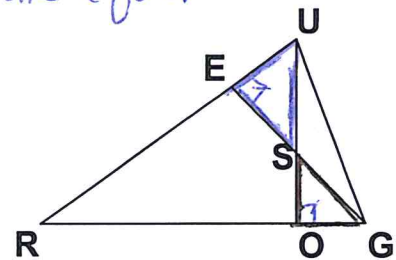
Prove: $\overline{SC} \cdot \overline{OU} = \overline{OT} \cdot \overline{SU}$



Statements	Reasons
① $\angle C \cong \angle OTU$	① given
② $\angle U \cong \angle U$	② reflexive property
③ $\triangle SCU \sim \triangle OTU$	③ AA \cong AA
④ $\frac{SC}{SU} = \frac{OT}{OU}$	④ CSSTIP
⑤ $\overline{SC} \cdot \overline{OU} = \overline{OT} \cdot \overline{SU}$	⑤ cross products are equal

6. Given: $\overline{UO} \perp \overline{RG}$, $\overline{UR} \perp \overline{EG}$

Prove: $\frac{US}{SO} = \frac{EU}{OG}$ no multiplication only 2 bottom steps



Statements	Reasons
① $\overline{UO} \perp \overline{RG}$, $\overline{UR} \perp \overline{EG}$	① given
② $\angle USE \cong \angle GSO$	② perpendicular lines form congruent right angles
③ $\angle USE \cong \angle GSO$	③ vertical angles are congruent

④ $\triangle ESU \sim \triangle OSG$	④ AA \cong AA
⑤ $\frac{US}{SO} = \frac{EU}{OG}$	⑤ CSSTIP

7. Given: $\overline{NQ} \perp \overline{RW}$, \overline{NQ} bisects $\angle RQW$

Prove: $\overline{RZ} \cdot \overline{QW} = \overline{RQ} \cdot \overline{ZW}$

Statements

- ① $\overline{NQ} \perp \overline{RW}$
- ② $\angle PZQ \cong \angle WZQ$
- ③ \overline{NQ} bisects $\angle RQW$
- ④ $\angle RQZ \cong \angle WQZ$

⑤ $\triangle RQZ \sim \triangle WQZ$

⑥ $\frac{\overline{RZ}}{\overline{ZW}} = \frac{\overline{RQ}}{\overline{QW}}$

⑦ $\overline{RZ} \cdot \overline{QW} = \overline{RQ} \cdot \overline{ZW}$

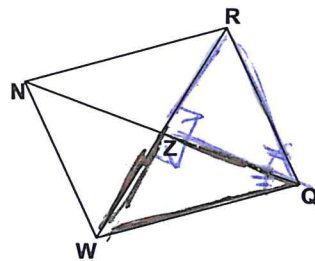
Reasons

- ① given
- ② perpendicular lines form congruent right angles
- ③ given
- ④ an angle bisector creates congruent right angles

⑤ AA \cong AA

⑥ CSSTIP

⑦ cross products are equal



8. Given: $\overline{TH} \parallel \overline{AS}$, $\overline{SM} \parallel \overline{HO}$

Prove: $\overline{TH} \cdot \overline{SM} = \overline{AS} \cdot \overline{HO}$

Statements

- ① $\overline{TH} \parallel \overline{AS}$, $\overline{SM} \parallel \overline{HO}$

② $\angle HTO \cong \angle SAM$
 $\angle SMA \cong \angle HOT$

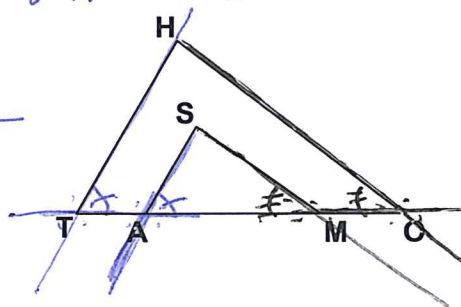
Reasons

- ① given
- ② Parallel lines cut by a transversal form congruent corresponding angles

③ AA \cong AA

④ CSSTIP

⑤ cross products are equal



③ $\triangle ASM \sim \triangle THO$

④ $\frac{\overline{TH}}{\overline{HO}} = \frac{\overline{AS}}{\overline{SM}}$

⑤ $\overline{TH} \cdot \overline{SM} = \overline{AS} \cdot \overline{HO}$

9. Given: $\overline{AB} \cong \overline{AC}$, $\overline{AF} \perp \overline{BC}$, $\overline{PD} \perp \overline{AB}$

Prove: $\overline{FC} \cdot \overline{PB} = \overline{DB} \cdot \overline{AC}$

Statements

① $\overline{AB} \cong \overline{AC}$

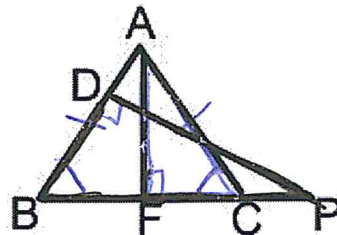
② $\angle ABC \cong \angle ACB$

③ $\overline{AF} \perp \overline{BC}$, $\overline{PD} \perp \overline{AB}$

④ $\angle PDB \cong \angle AFC$

Reasons

- ① given
- ② Isosceles Triangle Theorem
- ③ given
- ④ perpendicular lines form congruent right angles



⑤ $\triangle FCA \sim \triangle DBP$

⑥ $\frac{\overline{FC}}{\overline{AC}} = \frac{\overline{DB}}{\overline{PB}}$

⑦ $\overline{FC} \cdot \overline{PB} = \overline{DB} \cdot \overline{AC}$

⑤ AA \cong AA

⑥ CSSTIP

⑦ cross products are equal