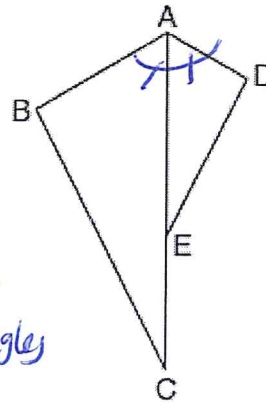


Proving Proportions and Multiplication

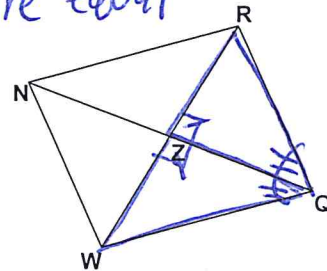
1. Given: \overline{CA} bisects $\angle BAD$, $\angle ABC \cong \angle ADE$
Prove: $\overline{BC} \cdot \overline{AE} = \overline{DE} \cdot \overline{AC}$ work backwards



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 $\triangle BAC \sim \triangle DAE$	④ AA
⑤ $\frac{BC}{AC} = \frac{DE}{AE}$	⑤ CSSTIP
⑥ $BC \cdot AE = DE \cdot AC$	⑥ cross products are equal

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

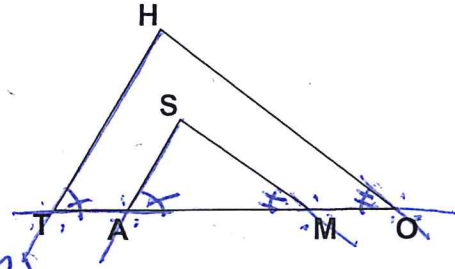
Prove: $\frac{RZ}{ZW} = \frac{RQ}{QW}$ work backwards



statements	Reasons
① $\overline{NQ} \perp \overline{RW}$	① given
② $\angle RZQ \cong \angle WZQ$	② Perpendicular lines create two congruent right angles.
③ \overline{NQ} bisects $\angle RQW$	③ given
④ $\angle RQZ \cong \angle WQZ$	④ An angle bisector creates two congruent angles
⑤ $\triangle RZQ \sim \triangle WZQ$	⑤ AA
⑥ $\frac{RZ}{ZW} = \frac{RQ}{QW}$	⑥ CSSTIP

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

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



Statements

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

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

③ $\triangle ASM \sim \triangle THO$

④ $\frac{TH}{HO} = \frac{AS}{SM}$

⑤ $TH \cdot SM = AS \cdot HO$

Reasons

① given

② parallel lines cut by a transversal creates congruent corresponding angles.

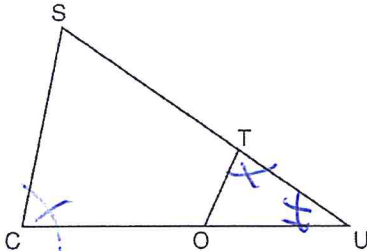
③ AA

④ CSSTIP

⑤ cross products are equal

4. In $\triangle SCU$ shown below, points T and O are on \overline{SU} and \overline{CU} , respectively. Segment OT is drawn so that $\angle C \cong \angle OTU$.

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



Statements

① $\angle C \cong \angle OTU$

② $\angle U \cong \angle U$

③ $\triangle SCU \sim \triangle OTU$

④ $\frac{SC}{SU} = \frac{OT}{OU}$

⑤ $\overline{SC} \cdot \overline{OU} = \overline{OT} \cdot \overline{SU}$

Reasons

① given

② Reflexive Property

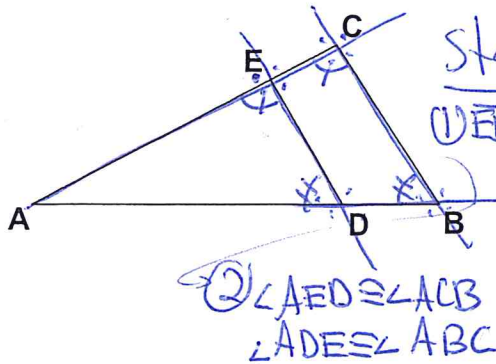
③ AA

④ CSSTIP

⑤ cross products are equal

5. Given: $\overline{ED} \parallel \overline{CB}$

Prove: $\overline{AE} \cdot \overline{CB} = \overline{ED} \cdot \overline{AC}$ -work backwards

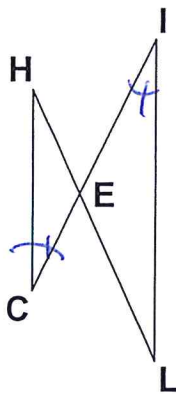


Statements	Reasons
① $\overline{ED} \parallel \overline{CB}$	① given
② $\angle AED \cong \angle ACB$ $\angle ADE \cong \angle ABC$	② parallel lines cut by a transversal create congruent corresponding angles.
③ $\triangle AED \sim \triangle ACB$	③ AA
④ $\frac{AE}{AC} = \frac{ED}{CB}$	④ CSSTIP
⑤ $\overline{AE} \cdot \overline{CB} = \overline{ED} \cdot \overline{AC}$	⑤ cross products are equal

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

Prove: $\frac{CE}{CH} = \frac{EI}{IL}$

work backwards

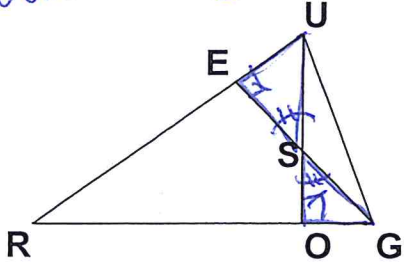


Statements	Reasons
① $\angle HCE \cong \angle LIE$	① given
② $\angle HEC \cong \angle LEI$	② vertical angles are congruent.
③ $\triangle CHE \sim \triangle LIE$	③ AA
④ $\frac{CE}{CH} = \frac{EI}{IL}$	④ CSSTIP

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

Prove: $\frac{US}{SO} = \frac{EU}{OG}$

WORK backwards



Statements

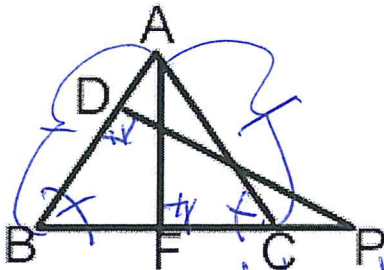
- ① $\overline{UO} \perp \overline{RG}, \overline{UR} \perp \overline{EG}$
- ② $\angle SOG \cong \angle SEU$
- ③ $\angle USE \cong \angle GSO$
- ④ $\triangle USE \sim \triangle GSO$
- ⑤ $\frac{US}{SO} = \frac{EU}{OG}$

Reasons

- ① Given
- ② Perpendicular lines form congruent right angles.
- ③ Vertical angles are congruent
- ④ AA
- ⑤ CSSTIP

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

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



Statements

- ① $\overline{AB} \cong \overline{AC}$
- ② $\angle DBP \cong \angle ACF$
- ③ $\angle AFD \cong \angle PDB$ ~~$\angle AFD \cong \angle PDB$~~ $\overline{AF} \perp \overline{BC}, \overline{PD} \perp \overline{AB}$
- ④ $\angle AFC \cong \angle PDB$

$$\triangle FCA \sim \triangle DBP$$

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

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

Reasons

- ① given
- ② Isosceles Triangle theorem
- ③ given
- ④ Perpendicular lines form congruent right angles.
- AA
- CSSTIP
- cross products are equal