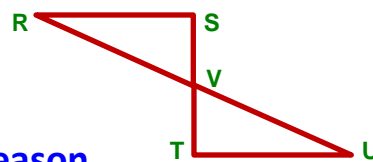


**Geometric Proofs #6 – Congruent Triangles**

**Given:**  $\overline{RS} \perp \overline{ST}$  and  $\overline{TU} \perp \overline{ST}$  and  $V$  is the midpoint of  $\overline{ST}$

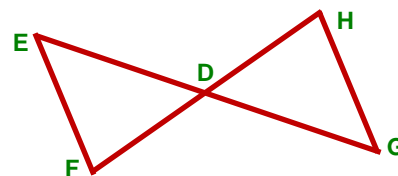
**Prove:**  $\triangle RSV \cong \triangle UTV$



Step	Statement	Step	Reason
1)	$\overline{RS} \perp \overline{ST}$ , $\overline{TU} \perp \overline{ST}$	1)	Given
2)	$m\angle S = 90^\circ$ , $m\angle T = 90^\circ$	2)	Definition of Perpendicular Lines
3)	$m\angle S = m\angle T$	3)	Substitution Property (from step 2)
4)	$\angle S \cong \angle T$	4)	Two angles with equal measures are congruent
5)	$V$ is the midpoint of $\overline{ST}$	5)	Given
6)	$\overline{SV} \cong \overline{TV}$	6)	Definition of Segment Midpoint
7)	$\angle RVS \cong \angle UVT$	7)	Vertical angles are congruent
8)	$\triangle RSV \cong \triangle UTV$	8)	ASA (from steps 3, 5, and 6)

**Given:**  $\overline{EG}$  and  $\overline{FH}$  bisect each other at  $D$

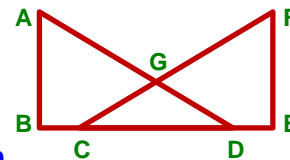
**Prove:**  $\overline{EF} \parallel \overline{GH}$



Step	Statement	Step	Reason
1)	$\overline{EG}$ and $\overline{FH}$ bisect each other at $D$	1)	Given
2)	$D$ is the midpoint of $\overline{EG}$ and $\overline{FH}$	2)	Definition of Segment Bisector
3)	$\overline{ED} \cong \overline{DG}$ , $\overline{FD} \cong \overline{DH}$	3)	Definition of Segment Midpoint
4)	$\angle EDF \cong \angle GDH$	4)	Vertical angles are congruent
5)	$\triangle EDF \cong \triangle GDH$	5)	SAS (from steps 3 and 4)
6)	$\angle E \cong \angle G$	6)	CPCTC
7)	$\overline{EF} \parallel \overline{GH}$	7)	Transversal with $\cong$ alternate interior $\angle$ s $\rightarrow$ $\parallel$ lines

**Given:**  $\overline{AB} \cong \overline{FE}$  and  $\overline{CG} \cong \overline{DG}$  and  $\angle A \cong \angle F$

**Prove:**  $\angle B \cong \angle E$



Step	Statement	Step	Reason
1)	$\overline{AB} \cong \overline{FE}$ , $\angle A \cong \angle F$	1)	Given
2)	$\overline{CG} \cong \overline{DG}$	2)	Given
3)	$\angle GCD \cong \angle GDC$	3)	Two congruent $\Delta$ sides $\rightarrow$ congruent opposite angles
4)	$\triangle ADB \cong \triangle FCE$	4)	AAS (from steps 1 and 3)
5)	$\angle B \cong \angle E$	5)	CPCTC