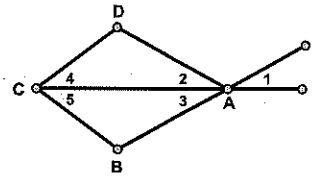
Triangle Congruence Proofs Task Cards

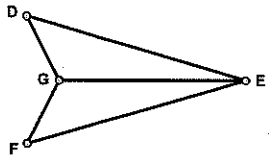
ANSWER KEY

1. Given: $\angle 1 \cong \angle 2$; $\overline{AC}$ bisects $\angle DCB$
   Prove: $\triangle CDA \cong \triangle CBA$



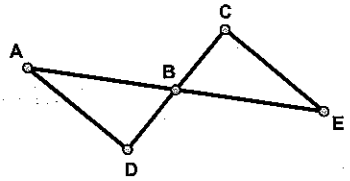
Statements	Reasons
1. $\overline{AC}$ bisects $\angle DCB$	1. Given
2. $\angle 4 \cong \angle 5$	2. Definition of Angle Bisector
3. $\angle 1 \cong \angle 2$	3. Given
4. $\angle 1 \cong \angle 3$	4. Vertical Angle Congruence Thm.
5. $\angle 2 \cong \angle 3$	5. Transitive Property of Congruence (3,4)
6. $\overline{CA} \cong \overline{CA}$	6. Reflexive Property of Congruence
7. $\triangle CDA \cong \triangle CBA$	7. ASA

2. Given: $\overline{GE}$ bisects $\angle DEF$; $\angle D \cong \angle F$
   Prove: $\triangle DGE \cong \triangle FGE$



Statements	Reasons
1. $\overline{GE}$ bisects $\angle DEF$	1. Given
2. $\angle DEG \cong \angle FEG$	2. Definition of Angle Bisector
3. $\angle D \cong \angle F$	3. Given
4. $\overline{GE} \cong \overline{GE}$	4. Reflexive Property of Congruence
5. $\triangle DGE \cong \triangle FGE$	5. AAS

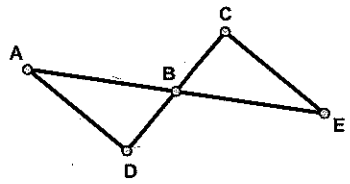
3. Given: $\overline{AE}$ bisects $\overline{DC}$; $\angle C \cong \angle D$
   Prove: $\triangle ABD \cong \triangle EBC$



Statements	Reasons
1. $\angle C \cong \angle D$	1. Given
2. $\overline{AE}$ bisects $\overline{DC}$	2. Given
3. $\overline{CB} \cong \overline{BD}$	3. Definition of Segment Bisector
4. $\angle ABD \cong \angle CBE$	4. Vertical Angle Congruence Thm.
5. $\triangle ABD \cong \triangle EBC$	5. ASA

4. Given: $\overline{AD} \parallel \overline{CE}$ and $\overline{BD} \cong \overline{BC}$

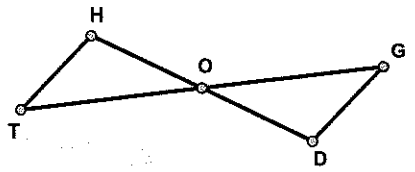
Prove: $\triangle ABD \cong \triangle EBC$



Statements	Reasons
1. $\overline{AD} \parallel \overline{CE}$	1. Given
2. $\angle D \cong \angle C$	2. Alternate Interior Angle Thm.
3. $\angle A \cong \angle E$	3. Alternate Interior Angle Thm.
4. $\overline{BD} \cong \overline{BC}$	4. Given
5. $\triangle ABD \cong \triangle EBC$	5. AAS

5. Given: $\overline{HD}$ and $\overline{GT}$ bisect each other

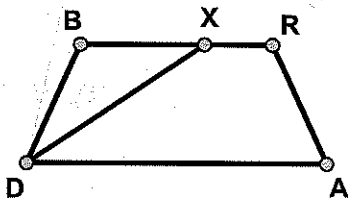
Prove: $\overline{HT} \parallel \overline{GD}$



Statements	Reasons
1. $\overline{HD}$ and $\overline{GT}$ bisect each other	1. Given
2. $\overline{HO} \cong \overline{OD}$	2. Definition of Segment Bisector
3. $\overline{TO} \cong \overline{OG}$	3. Definition of Segment Bisector
4. $\angle HOT \cong \angle DOG$	4. Vertical Angle Congruence Thm.
5. $\triangle HOT \cong \triangle DOG$	5. SAS
6. $\angle H \cong \angle D$	6. CPCTC
7. $\overline{HT} \parallel \overline{GD}$	7. Alternate Interior Angle Converse Thm.

SKIP

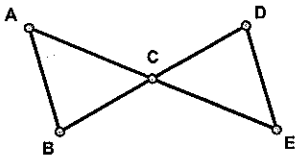
6. Given: $\overline{BR} \parallel \overline{AD}$; $\overline{DX}$ bisects $\angle BDA$



Prove: $\triangle DBX$ is isosceles

Statements	Reasons
1. $\overline{BR} \parallel \overline{AD}$	1. Given
2. $\angle XDA \cong BXD$	2. Alternate Interior Angle Thm.
3. $\overline{DX}$ bisects $\angle BDA$	3. Given
4. $\angle BDX \cong \angle XDA$	4. Definition of Angle Bisector
5. $\angle BDX \cong \angle BXD$	5. Transitive Property of Congruence (2,4)
6. $\overline{DB} \cong \overline{BX}$	6. Base Angles Thm. Converse
7. $\triangle DBX$ is isosceles	7. Definition of Isosceles Triangle

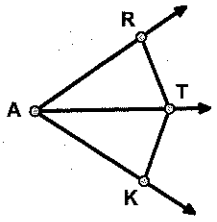
7. Given: $\overline{AB} \parallel \overline{DE}$; $\overline{AE}$ bisects $\overline{BD}$



Prove: $\triangle ABC \cong \triangle EDC$

Statements	Reasons
1. $\overline{AE}$ bisects $\overline{BD}$	1. Given
2. $\overline{BC} \cong \overline{DC}$	2. Definition of Segment Bisector
3. $\overline{AB} \parallel \overline{DE}$	3. Given
4. $\angle B \cong \angle D$	4. Alternate Interior Angle Thm.
5. $\angle ACB \cong \angle DCE$	5. Vertical Angle Congruence Thm.
6. $\triangle ABC \cong \triangle EDC$	6. ASA

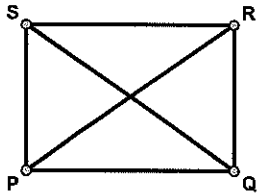
8. Given: $\overline{AK} \cong \overline{AR}$ and $\overline{KT} \cong \overline{RT}$



Prove: $\overrightarrow{AT}$ is an angle bisector

Statements	Reasons
1. $\overline{AK} \cong \overline{AR}$	1. Given
2. $\overline{KT} \cong \overline{RT}$	2. Given
3. $\overline{AT} \cong \overline{AT}$	3. Reflexive Property of Congruence
4. $\triangle ART \cong \triangle AKT$	4. SSS
5. $\angle RAT \cong \angle TAK$	5. CPCTC
6. $\overrightarrow{AT}$ is an angle bisector	6. Definition of Angle Bisector

9. Given: $\overline{QS} \cong \overline{PR}$; $\overline{PS} \perp \overline{RS}$; $\overline{QR} \perp \overline{RS}$

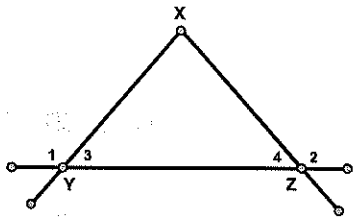


Prove: $\triangle PRS \cong \triangle QSR$

Statements	Reasons
1. $\overline{QS} \cong \overline{PR}$	1. Given
2. $\overline{PS} \perp \overline{RS}$	2. Given
3. $\overline{QR} \perp \overline{RS}$	3. Given
4. $\angle S$ and $\angle R$ are right angles	4. Definition of Perpendicular Lines
5. $\triangle PRS$ and $\triangle QSR$ are right triangles	5. Definition of Right Triangles
6. $\overline{RS} \cong \overline{RS}$	6. Reflexive Property of Congruence
7. $\triangle PRS \cong \triangle QSR$	7. HL

SKIP

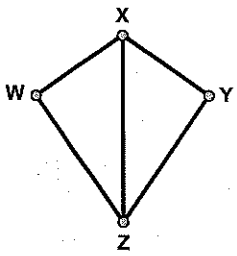
10. Given: $\angle 1 \cong \angle 2$



Prove: $\triangle XYZ$ is isosceles

Statements	Reasons
1. $\angle 1 \cong \angle 2$	1. Given
2. $\angle 1$ and $\angle 3$ are supplementary	2. Linear Pair Postulate
3. $\angle 2$ and $\angle 4$ are supplementary	3. Linear Pair Postulate
4. $\angle 3 \cong \angle 4$	4. Congruent Supplements Thm.
5. $\overline{XY} \cong \overline{XZ}$	5. Base Angles Thm. Converse
6. $\triangle XYZ$ is isosceles	6. Definition of Isosceles Triangle

11. Given: $\angle W$ and $\angle Y$ are right angles; $\overline{WX} \cong \overline{XY}$

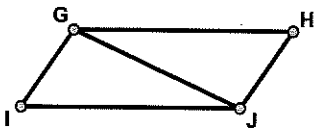


Prove: $\triangle XWZ \cong \triangle XYZ$

Statements	Reasons
1. $\angle W$ and $\angle Y$ are right angles	1. Given
2. $\triangle XWZ$ and $\triangle XYZ$ are right triangles	2. Definition of Right Triangle
3. $\overline{WX} \cong \overline{XY}$	3. Given
4. $\overline{XZ} \cong \overline{XZ}$	4. Reflexive Property of Congruence
5. $\triangle XWZ \cong \triangle XYZ$	5. HL

12. Given: $\overline{GH} \parallel \overline{IJ}$; $\angle IGJ \cong \angle HJG$

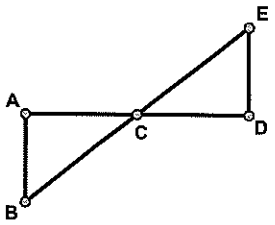
Prove: $\overline{IG} \cong \overline{HJ}$



Statements	Reasons
1. $\overline{GH} \parallel \overline{IJ}$	1. Given
2. $\angle IGJ \cong \angle HJG$	2. Given
3. $\angle HGJ \cong \angle IJG$	3. Alternate Interior Angles Thm.
4. $\overline{GJ} \cong \overline{GJ}$	4. Reflexive Property of Congruence
5. $\triangle IGJ \cong \triangle HJG$	5. ASA
6. $\overline{IG} \cong \overline{HJ}$	6. CPCTC

13. Given: $\overline{AB} \perp \overline{AD}$ and $\overline{DE} \perp \overline{AD}$; C is the midpoint of $\overline{BE}$

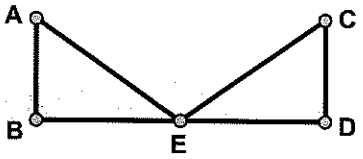
Prove: $\triangle ABC \cong \triangle DEC$



Statements	Reasons
1. $\overline{AB} \perp \overline{AD}$ and $\overline{DE} \perp \overline{AD}$	1. Given
2. $\angle A$ and $\angle D$ are right angles	2. Definition of Perpendicular Lines
3. $\angle A \cong \angle D$	3. Right Angle Congruence Thm.
4. C is the midpoint of $\overline{BE}$	4. Given
5. $\overline{BC} \cong \overline{CE}$	5. Definition of Midpoint
6. $\angle ACB \cong \angle ECD$	6. Vertical Angle Congruence Thm.
7. $\triangle ABC \cong \triangle DEC$	7. AAS

14. Given: $\overline{AE} \cong \overline{CE}$; $\overline{AB} \cong \overline{CD}$; E is the midpoint of $\overline{BD}$

Prove: $\triangle EAB \cong \triangle ECD$



Statements	Reasons
1. $\overline{AE} \cong \overline{CE}$	1. Given
2. $\overline{AB} \cong \overline{CD}$	2. Given
3. E is the midpoint of $\overline{BD}$	3. Given
4. $\overline{BE} \cong \overline{ED}$	4. Definition of Midpoint
5. $\triangle EAB \cong \triangle ECD$	5. SSS