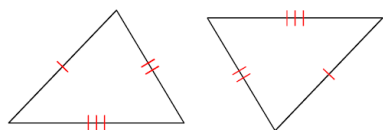
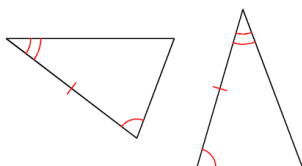


TOPIC 5 – Congruent Triangles (G.6)

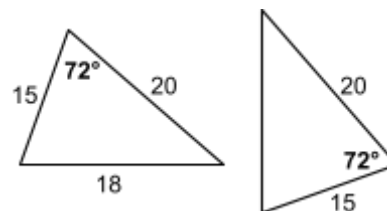
Side-Side-Side Postulate (SSS)



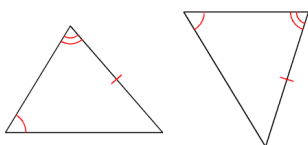
Angle-Side-Angle Postulate (ASA)



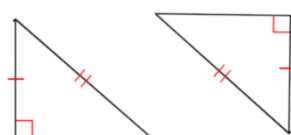
Side-Angle-Side Postulate (SAS)



Angle-Angle-Side Theorem (AAS)



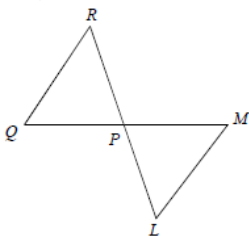
Hypotenuse-Leg Theorem (HL)



Statement	Reason
(Prove $\triangle \cong \triangle$) $\triangle ABC \cong \triangle DEF$	(Choose one...) ASA AAS SAS SSS HL

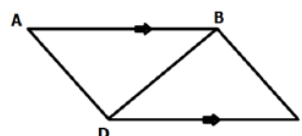
What we know we can mark (and the statement):

Vertical angles (bowtie)



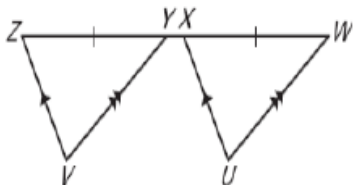
Statement	Reason
	Vertical Angles are congruent

Alternate interior angles (zig-zag)



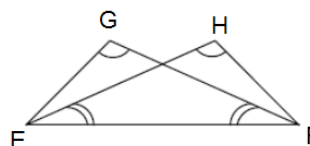
Statement	Reason
	Alternate Interior angles are congruent when lines are parallel

Corresponding angles (mountains)



Statement	Reason
	Corresponding angles are congruent when lines are parallel
	Corresponding angles are congruent when lines are parallel

Reflexive property (shared side)



Statement	Reason
	Reflexive property

Proofs: Helpful hints!

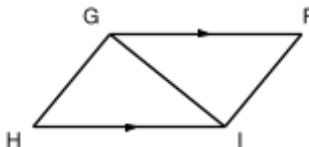
- Mark what is noted and what you know (see above) AS YOU GO THROUGH EACH STATEMENT.
- Label A or S to the side of each statement.
- **Corresponding Parts of Congruent Triangles are Congruent: ONLY AFTER TRIANGLES CONGRUENT STATEMENT**

Example: Use the statements and reasons in the box on the right to complete the proof.

Given: $\angle GHI \cong \angle IFG$

$$\overline{GF} \parallel \overline{HI}$$

Prove: $\overline{GH} \cong \overline{FI}$

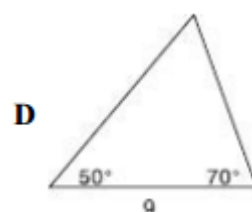
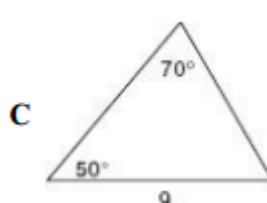
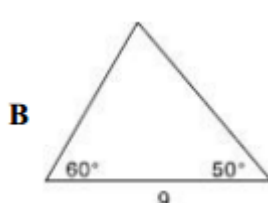
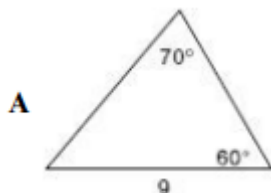


STATEMENTS & REASONS:	
A	If two lines are parallel, then corresponding angles are congruent.
B	AAS
C	$\overline{GH} \cong \overline{FI}$
D	Given
E	$\overline{GI} \cong \overline{IG}$
F	If two lines are parallel, then alternate interior angles are congruent.
G	$\overline{GF} \parallel \overline{HI}$
H	ASA

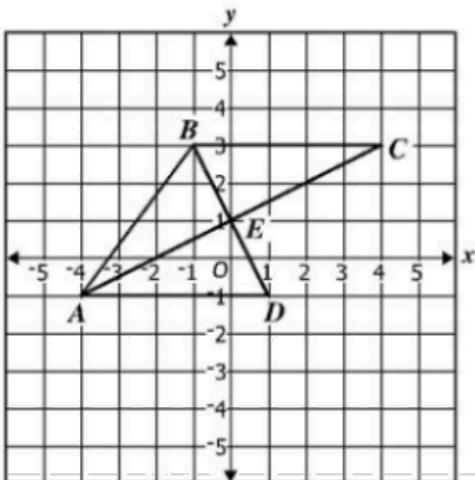
Statements	Reasons
1. $\angle GHI \cong \angle IFG$	
2.	Given
3. $\angle FGI \cong \angle HIG$	
4.	Reflexive Property
5. $\triangle HIG \cong \triangle FGI$	
6.	Corresponding Parts of Congruent Triangles are congruent

More Examples:

Which triangle below is *not* congruent to the other three triangles?



Triangles ABE, ADE, and CBE are shown on the coordinate grid, and all the vertices have coordinates that are integers.

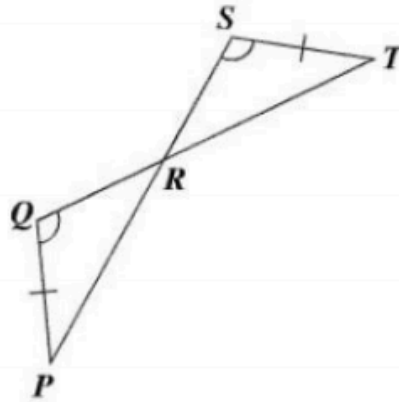


Which statement is true?

- F No two triangles are congruent.
- G Only $\triangle ABE$ and $\triangle CBE$ are congruent.
- H Only $\triangle ABE$ and $\triangle ADE$ are congruent.
- J Triangle ABE, ADE, and CBE are all congruent.

Practice:

____ 1.

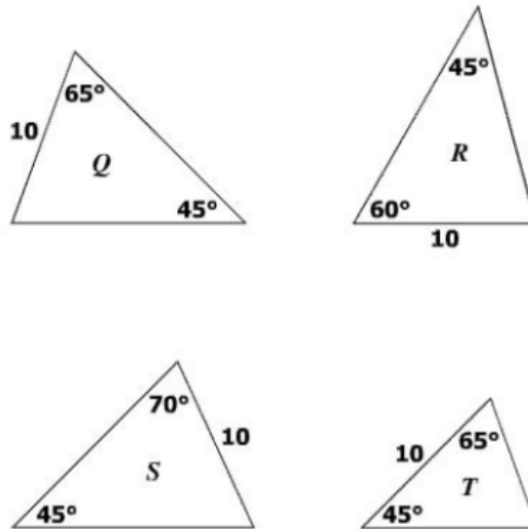


Using the information given, which congruence postulate or theorem can be used to prove that $\triangle PQR \cong \triangle TSR$?

- A Side-Side-Side Postulate
- B Side-Angle-Side Postulate
- C Hypotenuse-Leg Theorem
- D Angle-Angle-Side Theorem

____ 2. Given the measures shown in the diagram, which two triangle are congruent?

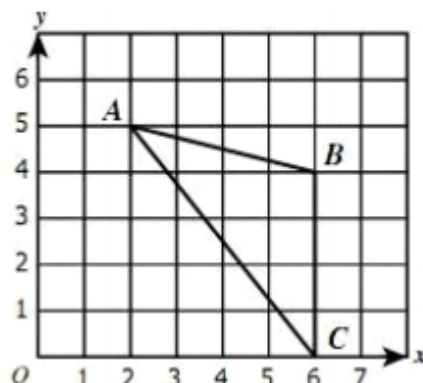
- A Q and S
- B R and T
- C R and S
- D Q and T



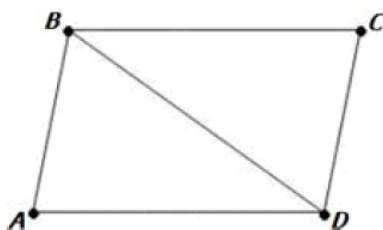
____ 3. Coordinates $A (2,5)$, $B (6,4)$ and $C (6,0)$ are connected to form $\triangle ABC$.

If $\triangle CDA$ is congruent to $\triangle ABC$, what are the coordinates of D ?

- F (1,2)
- G (2,1)
- H (1,1)
- J (2,2)



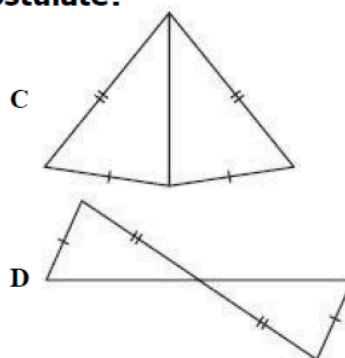
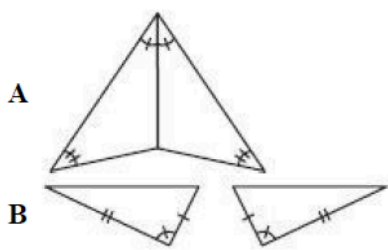
4. Given: $\overline{BA} \cong \overline{DC}$
 $\overline{CB} \cong \overline{AD}$



Which postulate/theorem would be sufficient to prove $\triangle ABD \cong \triangle CDB$?

- F Angle-Side-Angle (ASA)
- G Side-Side-Side (SSS)
- H Side-Angle-Side (SAS)
- J Angle-Angle-Side (AAS)

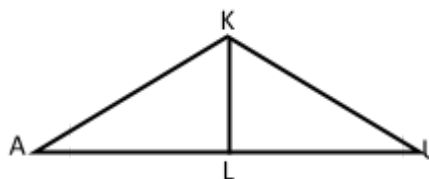
5. With the information given in the drawings, which pair of triangles can be proven congruent by the Side-Angle-Side postulate?



6. Use the reasons in the box at the right to complete the proof.

Given: $\overline{KL} \perp \overline{AU}$ and $\overline{KA} \cong \overline{KU}$

Prove: $\triangle KAL \cong \triangle KUL$



Statements	Reasons
1. $\overline{KL} \perp \overline{AU}$	
2. $\overline{KA} \cong \overline{KU}$	
3. $m\angle KLA = m\angle KLU = 90^\circ$	
4. $\overline{KL} \cong \overline{KL}$	
5. $\triangle KAL \cong \triangle KUL$	

REASONS:	
A	Given
B	HL
C	Vertical Angles are congruent
D	Definition of Perpendicular
E	Corresponding Parts of Congruent Triangles are \cong
F	Reflexive Property
G	Given
H	ASA