4-3 Triangle Congruence by ASA and AAS

Vocabulary

Review

1. Cross out the figure(s) that are NOT *triangle*(s).

2. A *triangle* is a polygon with _____ sides.

3. A *triangle* with a right angle is called a(n) obtuse / right / scalene *triangle*.

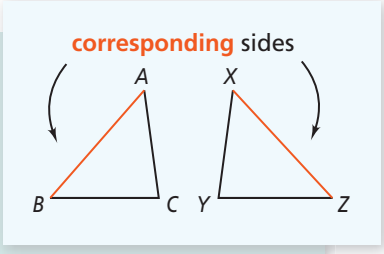
Vocabulary Builder

corresponding (adjective) **kawr uh SPAHN ding**

Other Word Forms: correspond (verb); correspondence (noun)

Definition: **Corresponding** means similar in position, purpose, or form.

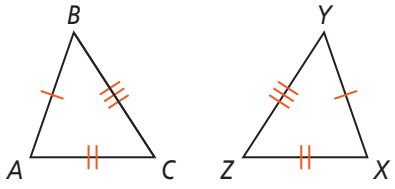
Math Usage: Congruent figures have congruent **corresponding** parts.



Use Your Vocabulary

Draw a line from each part of $\triangle ABC$ in Column A to the *corresponding* part of $\triangle XYZ$ in Column B.

Column A	Column B
4. $\overline{BC}$	$\angle Z$
5. $\angle A$	$\angle Y$
6. $\overline{AB}$	$\overline{YZ}$
7. $\angle C$	$\angle X$
8. $\overline{AC}$	$\overline{XY}$
9. $\angle B$	$\overline{XZ}$



take note

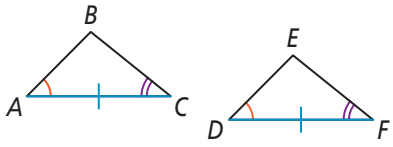
Postulate 4–3 Angle-Side-Angle (ASA) Postulate

Postulate

If two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then the two triangles are congruent.

If . . .

$\angle A \cong \angle D, \overline{AC} \cong \overline{DF}, \angle C \cong \angle F$



Then . . .

$\triangle ABC \cong \triangle DEF$

10. Explain how the ASA Postulate is different from the SAS Postulate.

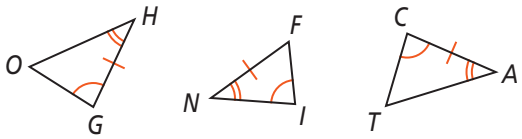
_____

_____

_____

Problem 1 Using ASA

Got It? **Which two triangles are congruent by ASA? Explain.**



11. Name the triangles. List the vertices in corresponding order: list the vertex with the one arc first, the vertex with the two arcs second, and the third vertex last.

12. $\angle G \cong \angle$ ____ $\cong \angle$ ____

13. $\angle H \cong \angle$ ____ $\cong \angle$ ____

14. $\overline{HG} \cong$ ____ $\cong$ ____

15. The congruent sides that are included between congruent angles are ____ and ____.

16. Write a congruence statement. Justify your reasoning.

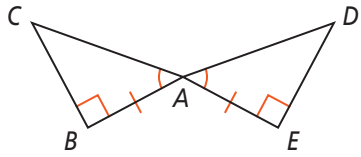
$\triangle$ ____ $\cong \triangle$ ____

_____

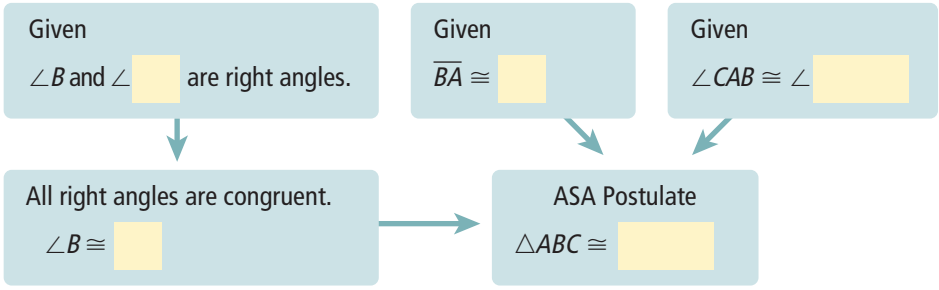
_____

Problem 2 Writing a Proof Using ASA

Got It? Given: $\angle CAB \cong \angle DAE$, $\overline{BA} \cong \overline{EA}$, $\angle B$ and $\angle E$ are right angles
Prove: $\triangle ABC \cong \triangle AED$



17. Complete the flow chart to prove $\triangle ABC \cong \triangle AED$.



take note

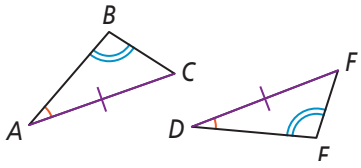
Theorem 4–2 Angle-Angle-Side (AAS) Theorem

Theorem

If two angles and a nonincluded side of one triangle are congruent to two angles and the corresponding nonincluded side of another triangle, then the two triangles are congruent.

If . . .

$\angle A \cong \angle D$, $\angle B \cong \angle E$, $\overline{AC} \cong \overline{DF}$



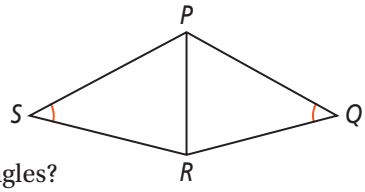
Then . . .

$\triangle ABC \cong \triangle DEF$

18. The nonincluded congruent sides of $\triangle ABC$ and $\triangle DEF$ are ___ and ___.

Problem 3 Writing a Proof Using AAS

Got It? Given: $\angle S \cong \angle Q$, $\overline{RP}$ bisects $\angle SRQ$
Prove: $\triangle SRP \cong \triangle QRP$



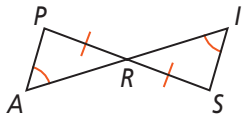
19. How do you know which angles in the diagram are corresponding angles?

20. Complete the statements to prove $\triangle SRP \cong \triangle QRP$.

Statements	Reasons
1) $\angle S \cong$ ___	1) Given
2) $\overline{RP}$ bisects ___	2) Given
3) $\angle SRP \cong$ ___	3) Definition of an angle bisector
4) $\overline{RP} \cong$ ___	4) Reflexive Property of Congruence
5) $\triangle SRP \cong$ ___	5) AAS

Problem 4 Determining Whether Triangles Are Congruent

Got It? Are $\triangle PAR$ and $\triangle SIR$ congruent? Explain.



21. The congruence marks show that $\angle A \cong$ ____ and $\overline{PR} \cong$ ____.

22. What other corresponding congruent parts exist? Explain.

_____

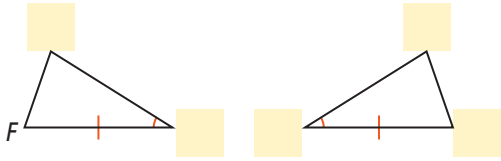
23. Are $\triangle PAR$ and $\triangle SIR$ congruent? If so, what theorem proves them congruent?

_____

Lesson Check • Do you UNDERSTAND?

Reasoning **Suppose $\angle E \cong \angle I$ and $\overline{FE} \cong \overline{GI}$. What else must you know in order to prove $\triangle FDE$ and $\triangle GHI$ are congruent by ASA? By AAS?**

24. Label the diagram at the right.



25. To prove the triangles congruent by ASA, what do you need?

_____

_____

26. To prove the triangles congruent by AAS, what do you need?

_____

_____

27. If you want to use ASA, $\angle$ ____ and $\angle$ ____ must also be congruent.

28. If you want to use AAS, $\angle$ ____ and $\angle$ ____ must also be congruent.

Math Success

Check off the vocabulary words that you understand.

☐ included ☐ nonincluded ☐ corresponding

Rate how well you can *use ASA and AAS*.

Need to review 0 2 4 6 8 10 Now I get it!