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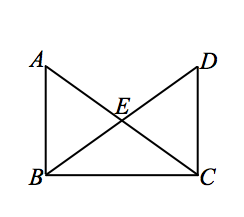
Lesson 26: Triangle Congruency Proofs

**Student Outcomes**

* Students complete proofs requiring a synthesis of the skills learned in the last four lessons.

Classwork

Exercises 1–6 (40 minutes)

  
Exercises 1–6

1. Given: .

bisects , bisects .

.

Prove: .

*, Given*

*, Definition of perpendicular lines*

*Transitive property*

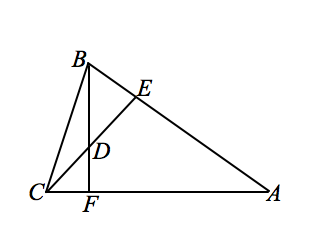
*bisects , bisects Given*

*, Definition of an angle bisector*

*Given*

*Vertical angles are equal in measure*

*ASA*



1. Given: .

.

Prove: .

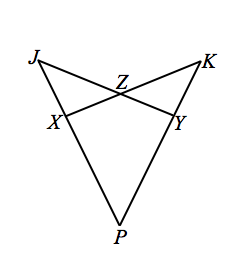
*, Given*

*, Definition of perpendicular*

*Given*

*Reflexive property*

*ASA*

1. Given: .

Prove: .

,, Given

Segment addition

*Vertical angles are equal in measure.*

AAS

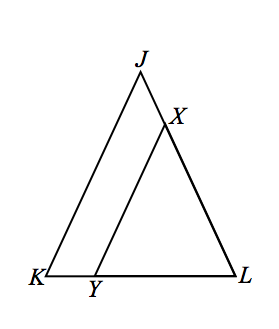
Corresponding angles of congruent triangles are congruent

Reflexive property

AAS

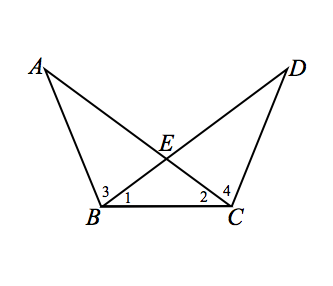
Corresponding sides of congruent triangles are congruent

Definition of congruent segments



1. Given: ,.

Prove: .

 *Given*

*Base angles of an isosceles triangle are equal in measure*

*Given*

*When two parallel lines are cut by a transversal, corresponding angles are equal in measure*

*Transitive property*

*If two angles of a triangle are congruent, then the sides opposite the angles are equal in length*

1. Given: , .

Prove: .

Given

When two angles of a triangle are congruent, it is an isosceles triangle

Given

Vertical angles are congruent

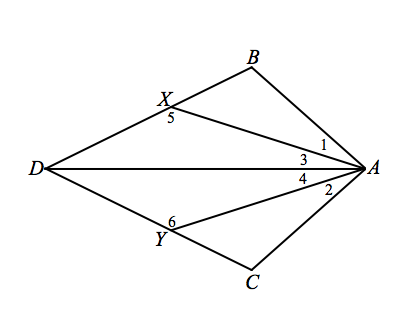
ASA

Corresponding angles of congruent triangles are congruent

Reflexive property

AAS

Corresponding sides of congruent triangles are congruent

1. Given: ,,.

Prove: (a) .

(b) .

*, Given*

*,*

*Angle addition postulate*

*Substitution property of equality*

Reflexive property

SAS

Corresponding angles of congruent triangles are congruent

ASA

Corresponding angles of congruent triangles are congruent

Exit Ticket (5 minutes)

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lesson 26: Triangle Congruency Proofs

Exit Ticket

Identify the two triangle congruence criteria that do NOT guarantee congruence. Explain why they do not guarantee congruence and provide illustrations that support your reasoning.

Exit Ticket Sample Solutions

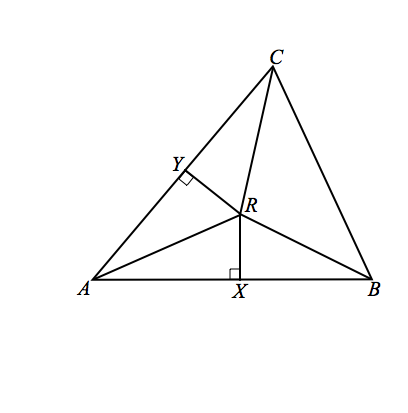
Identify the two triangle congruence criteria that do NOT guarantee congruence. Explain why they do not guarantee congruence and provide illustrations that support your reasoning.

Students should identify AAA and SSA as the two types of criteria that do not guarantee congruence. Appropriate illustrations should be included with their justifications.

Problem Set Sample Solutions

Use your knowledge of triangle congruence criteria to write a proof for the following:

In the figure and are the perpendicular bisectors of and , respectively.

Prove: (a) .

(b) .

is the perpendicular bisector of Given

is the perpendicular bisector of Given

*, Definition of perpendicular bisector*

Reflexive property

, are right triangles Definition of right triangle

HL

*, Definition of perpendicular bisector*

, Definition of perpendicular bisector

, Reflexive property

, SAS

Transitive property

Corresponding sides of congruent triangles are congruent