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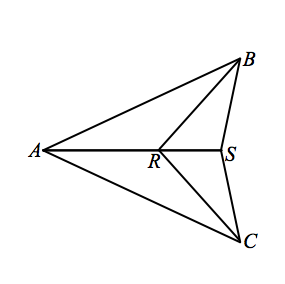
Lesson 27: Triangle Congruency Proofs

**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: , .

Prove: .

, Given

Reflexive property

SSS

*Corresponding angles of congruent triangles are equal in measure*

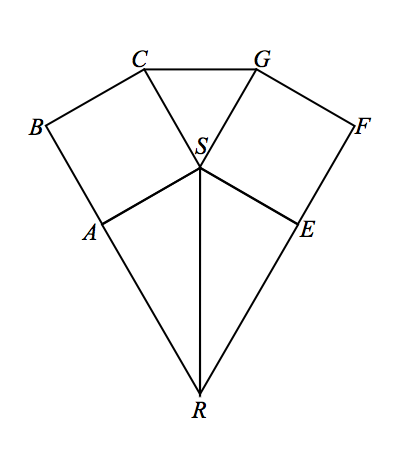
*, Linear pairs form supplementary angles*

*Angles supplementary to either the same angle or to congruent angles are equal in measure*

Reflexive property

SAS

Corresponding sides of congruent angles are equal in length

1. Given: Square Square ,

, .

Prove: .

Square Square Given

Corresponding sides of congruent squares are equal in length

Reflexive property

andare right angles Definition of square

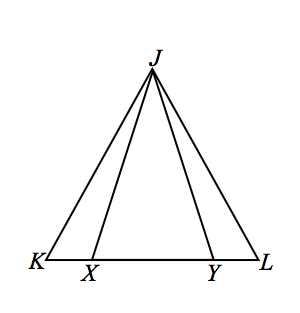
andform a linear pair Definition of linear pair

andform a linear pair Definition of linear pair

and are right angles Two angles that are supplementary and congruent each measure and are, therefore, right angles

and are right triangles Definition of right triangle

HL

1. Given: ,.

Prove: .

*Given*

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

*,*

*Linear pairs form supplementary angles.*

*Substitution property of equality*

*Substitution property of equality*

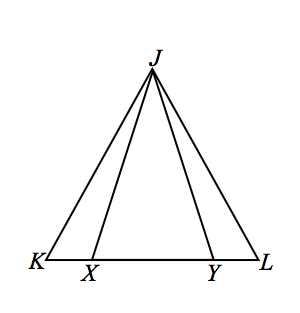
*Angles supplementary to either the same angle or congruent angles are equal in measure*

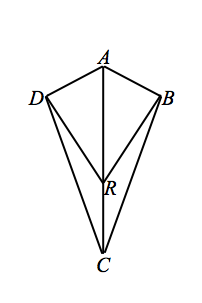
*Given*

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

*AAS*

*Corresponding sides of congruent triangles are equal in length*



1. Given: ,

.

Prove: .

, Given

and are right triangles Definition of right triangle

Given

Reflexive property

HL

Corresponding angles of congruent triangles are congruent

*,*

*Linear pairs form supplementary angles.*

*Transitive property*

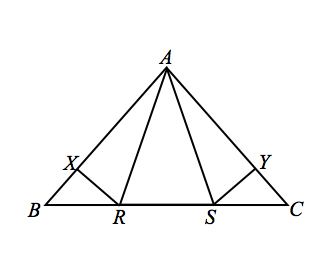
*Angles supplementary to either the same angle or congruent angles are equal in measure*

Corresponding sides of congruent triangles are congruent

Reflexive property

SAS

Corresponding angles of congruent triangles are congruent

1. **Given: , ,

,.

Prove: .

*Given*

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

*,*

*Linear pairs form supplementary angles*

*Transitive property*

*Subtraction*

*Given*

*SAS*

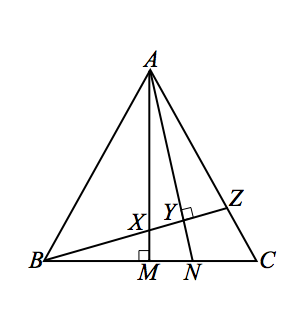
*Corresponding angles of congruent triangles are congruent*

*Given*

*Definition of perpendicular line segments.*

*AAS*

*Corresponding sides of congruent triangles are equal in length*

1. Given: , .

Prove: .

*Given*

*Given*

*Vertical angles are equal in measure*

*AAS*

*, Segments add*

*Corresponding sides of congruent triangles are equal in length*

*Substitution property of equality*

*Vertical angles are equal in measure*

*Linear pairs form supplementary angles*

*Subtraction property of equality*

*Reflexive property*

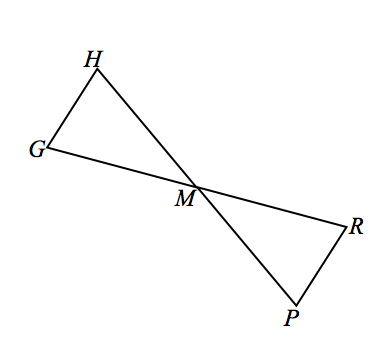
*AAS*

*Corresponding sides of congruent triangles are equal in length*

Exit Ticket (5 minutes)

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

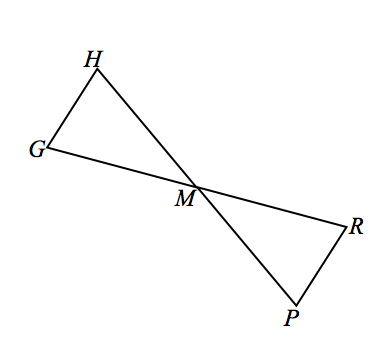
Lesson 27: Triangle Congruency Proofs

Exit Ticket

Given: is the midpoint of , ∠∠.

Prove: .

Exit Ticket Sample Solutions



Given: is the midpoint of , ∠ ∠.

Prove: .

is the midpoint of GR Given

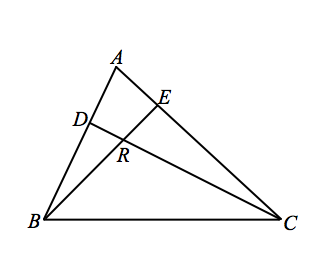
∠∠ Given

Definition of midpoint

∠∠ Vertical angles are congruent.

ASA

Problem Set Sample Solutions

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

In the figure , ,, prove .

*Vertical angles are equal in measure*

*Given*

*, Definition of perpendicular lines*

*Sum of the angle measures in a triangle is*

*Sum of the angle measures in a triangle is*

*Substitution property of equality*

*Given*

*AAS*

*Corresponding sides of congruent triangles are congruent*