3.8. Honors Geometry

DATE: 11/29

In a rt. Δ

Target 3B. Understand and apply the theorems and postulates sufficient to prove triangles congruent

Hypotenuse-Leg Theorem (HL):

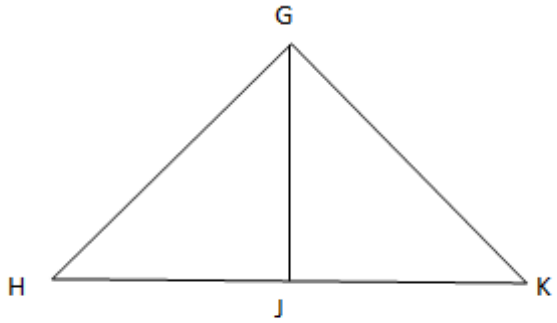
- If the hypotenuse and leg of one right triangle are congruent to the corresponding hypotenuse and leg of another right triangle, then the two triangles are congruent.

Examples

Given: GJ is the altitude to HK

HG≅KG

Prove: ΔGHJ≅ΔGKJ



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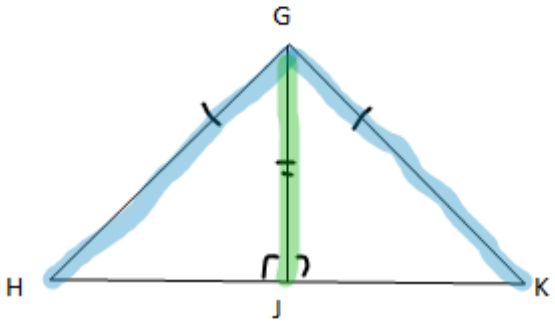


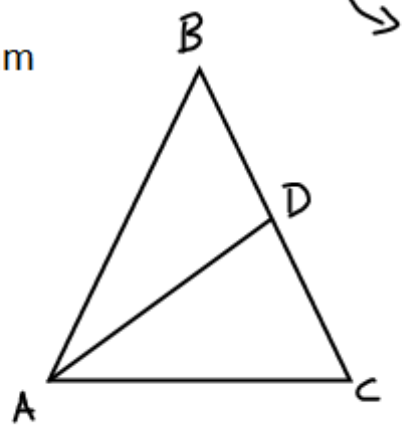
Statements	Reasons
① $\overline{GJ}$ alt to $\overline{HK}$ * $\overline{HG} \cong \overline{KG}$	① Given
② ∠GJH ∠GJK rt.∠	② Definition of altitude
③ $\overline{GJ} \cong \overline{GJ}$	③ Reflexive Property
④ ΔGHJ ≅ ΔGKJ	④ HL (step 1*, 3)

Prove that an altitude of an equilateral triangle is also the median of the triangle.

Given: ΔABC equilateral
$\overline{AD}$ altitude to $\overline{BC}$

Prove: $\overline{AD}$ median to $\overline{BC}$

Diagram



↳ we'll learn more about setting up in next unit ☺

Statements	Reasons
① ΔABC equi $\overline{AD}$ alt. to $\overline{BC}$	① Given
② $\overline{AB} \cong \overline{AC}$	② Definition of equi Δ.
③ $\angle BDA, \angle CDA$ rt. $\angle$	③ Definition of altitude
④ $\overline{AD} \cong \overline{AD}$	④ Reflexive property
⑤ $\Delta ABD \cong \Delta ACD$	⑤ HL
⑥ $\overline{BD} \cong \overline{CD}$	⑥ CPCTC
⑦ $\overline{AD}$ median to $\overline{BC}$	⑦ If a seg from vertex of a Δ ÷s the opposite side into 2 $\cong$ segments, then it's a median.