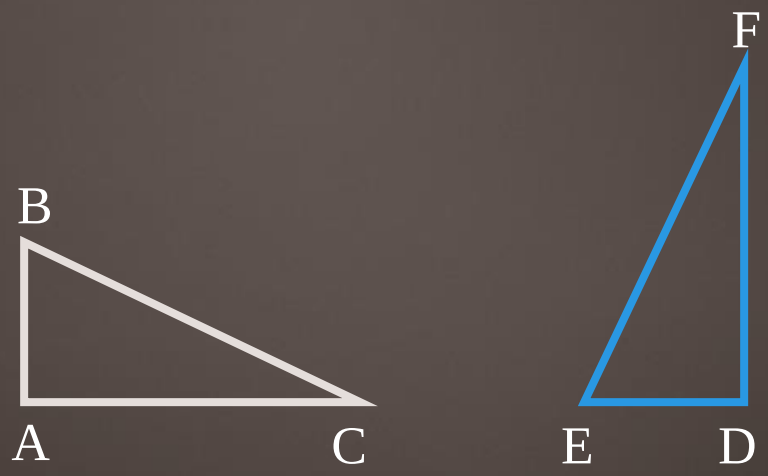
Proving Triangles Congruent

UNIT 4 LESSON 2

The Idea of a Congruence

Two geometric figures with exactly the same size and shape.



How much do you need to know about two triangles to prove that they are congruent?

Reflexive Property of Congruence

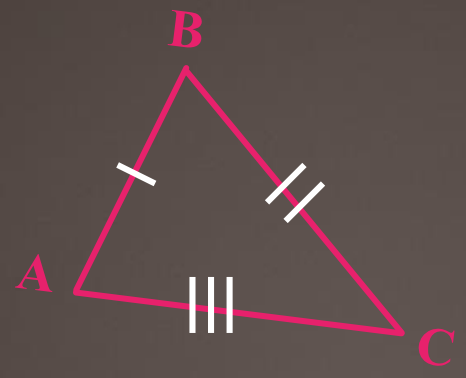
- A segment is congruent to itself.
- An angle is congruent to itself.

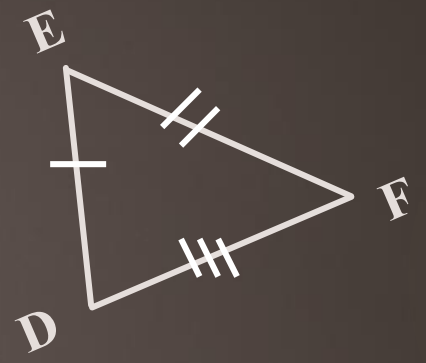
Side-Side-Side **(SSS)**

Postulate:

If three sides of one triangle are congruent to three sides of another triangle, then the two triangles are congruent.

Side-Side-Side (SSS)





1. $\overline{AB} \cong \overline{DE}$
2. $\overline{BC} \cong \overline{EF}$
3. $\overline{AC} \cong \overline{DF}$

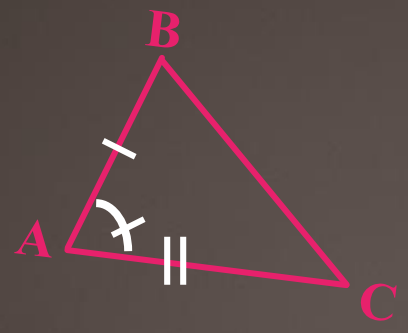
$\Delta ABC \cong \Delta DEF$

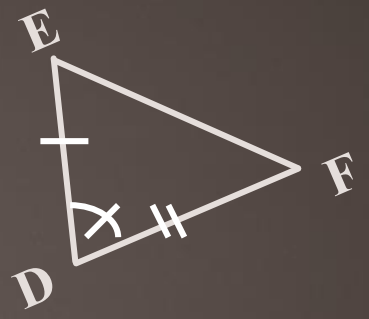
Side-Angle-Side (SAS)

Postulate:

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

Side-Angle-Side (SAS)





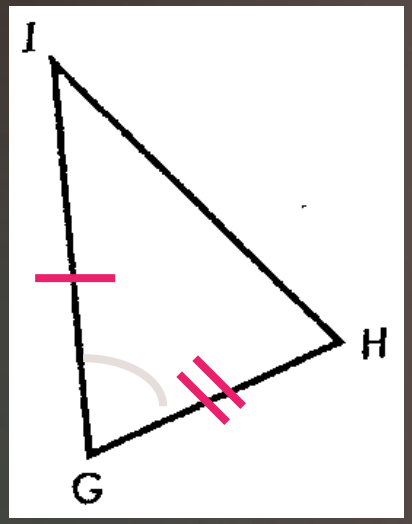
1. $\overline{AB} \cong \overline{DE}$
2. $\angle A \cong \angle D$
3. $\overline{AC} \cong \overline{DF}$

$\Delta ABC \cong \Delta DEF$

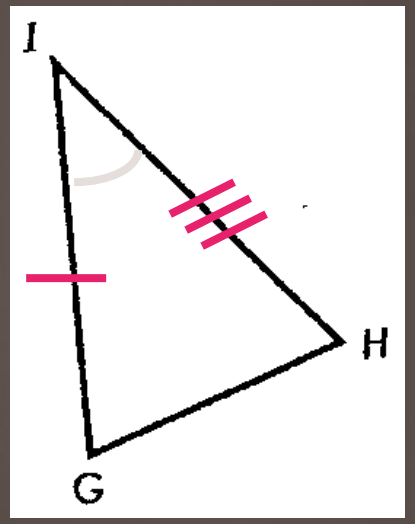
included angle

Included Angle

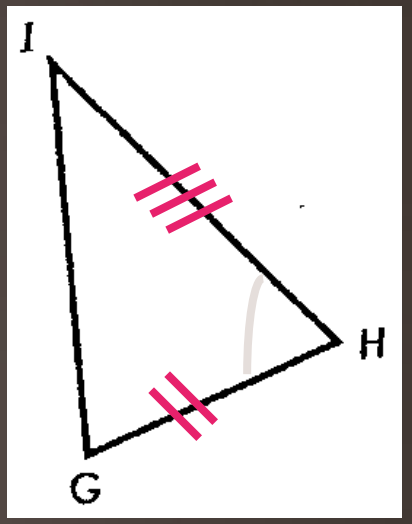
The angle between two sides



∠G



∠I



∠H

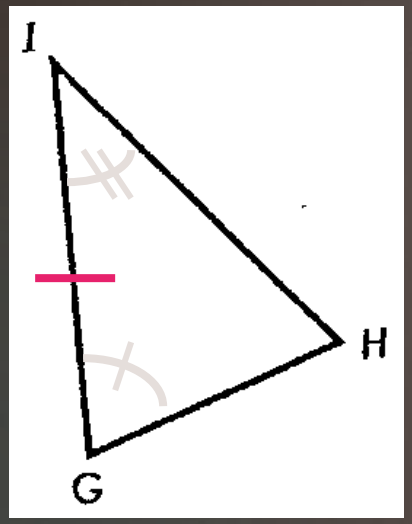
Included Angle

Name the included angle:

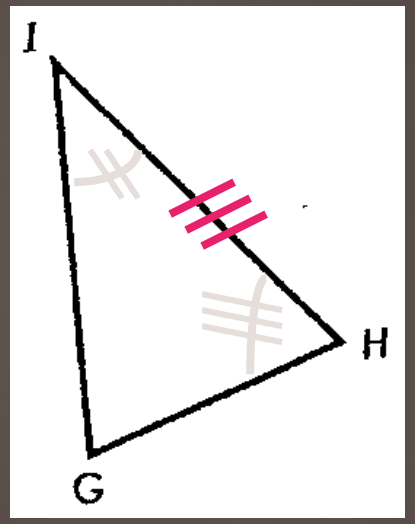
$\overline{YE}$ and $\overline{ES}$	$\angle E$
$\overline{ES}$ and $\overline{YS}$	$\angle S$
$\overline{YS}$ and $\overline{YE}$	$\angle Y$

Included Side

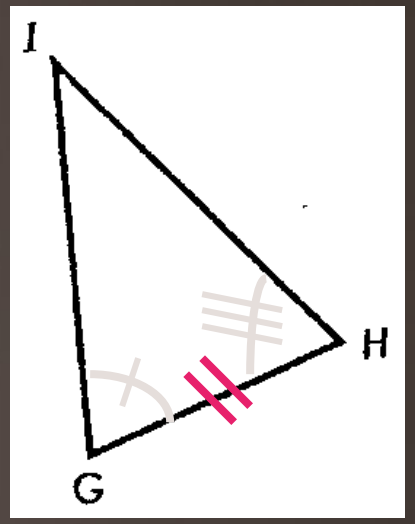
The side between two angles



$\overline{GI}$



$\overline{HI}$



$\overline{GH}$

Included Side

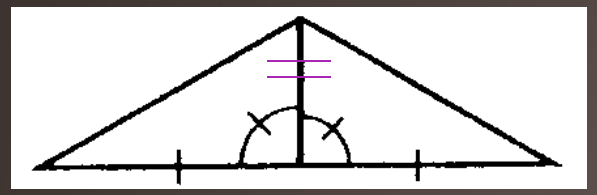
Name the included angle:

∠Y and ∠E $\overline{YE}$

∠E and ∠S $\overline{ES}$

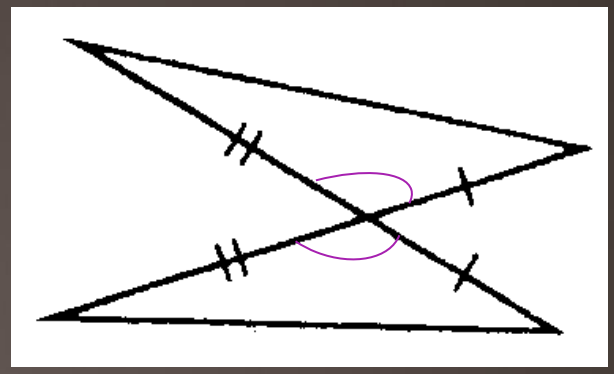
∠S and ∠Y $\overline{SY}$

How are the triangles congruent?



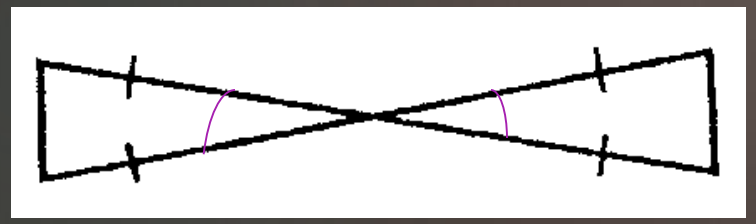
Reflexive Property

SAS



Vertical Angles

SAS



Vertical Angles

SAS