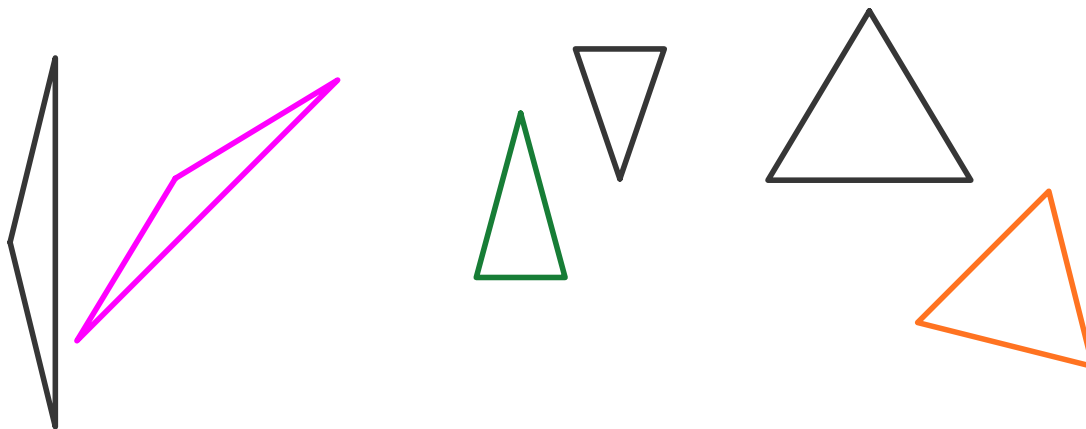4.4 Proving and Applying the ASA and AAS Congruence
Criteria

Monday, September 23, 2019   7:46 AM

Warm Up

Are the following triangles congruent?

Essential Question

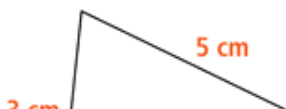How are ASA and AAS used to show that triangles are congruent?

Needed Vocab:
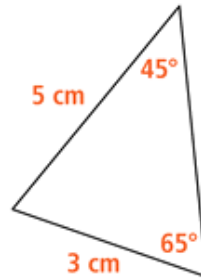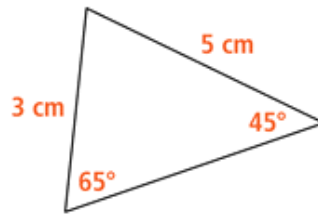► **Angle Side Angle**
► **Angle Angle Side**

Goal: "I can...
Determine congruent triangles by comparing two sides and one angle."

Are the two triangles congruent? What reasoning can you give to justify your answer?

5 cm

3 cm

answer?

5 cm

3 cm

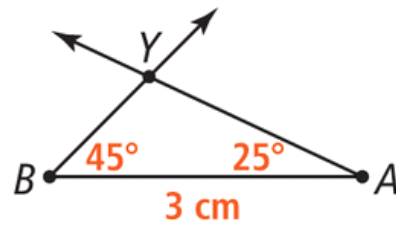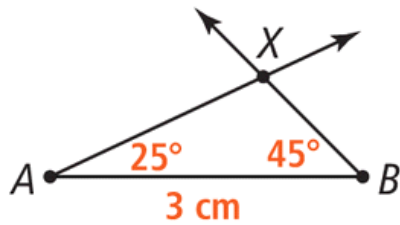45°

65°

45°

5 cm

65°

3 cm

EXAMPLE 1

How many possible triangles can you make when given two angles and the included side of a triangle?

38

58

What is the relationship between ΔAXB and ΔAYB?

Angle-Side-Angle (ASA) Congruence Criterion

If two angles of one triangle and the included side are congruent to two angles and the included side of another triangle, then the two triangles are congruent.
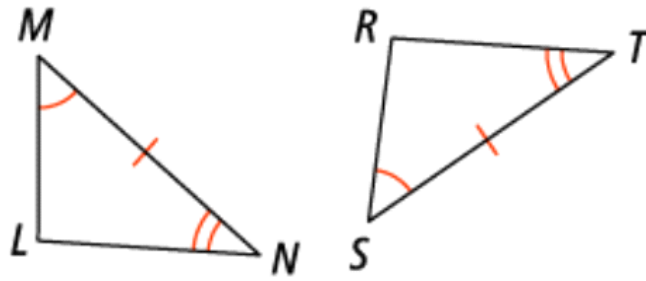
PROOF: SEE EXAMPLE 2.

If...
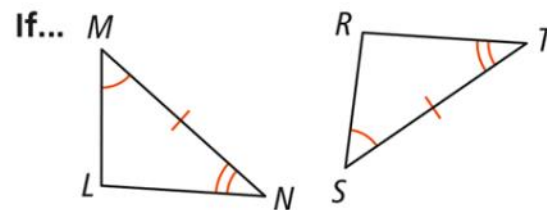
Then... △MLN ≅ △SRT
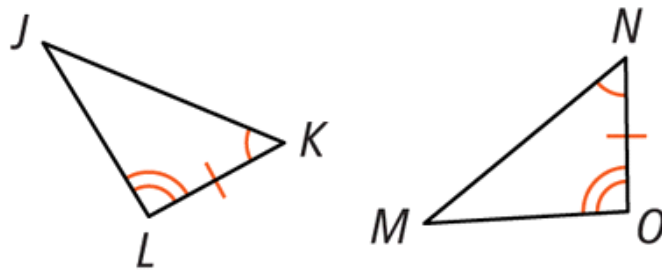
Example 2

Given two sets of congruent angles and congruent included side lengths, prove that the two triangles are congruent. (Discuss, DO NOT WRITE A PROOF)
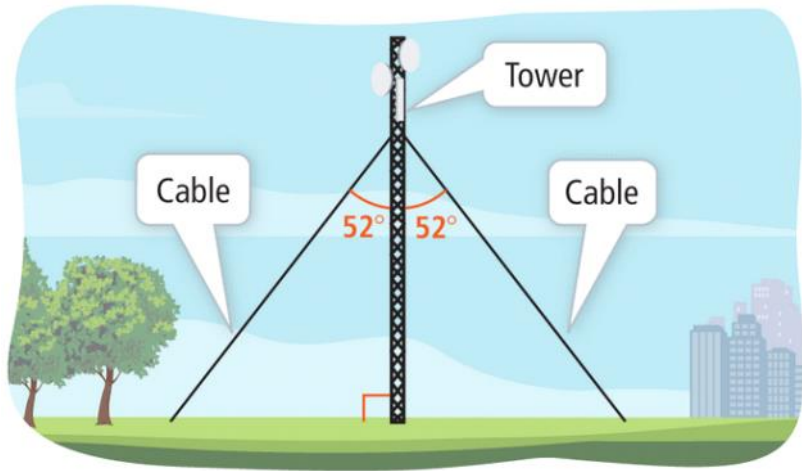

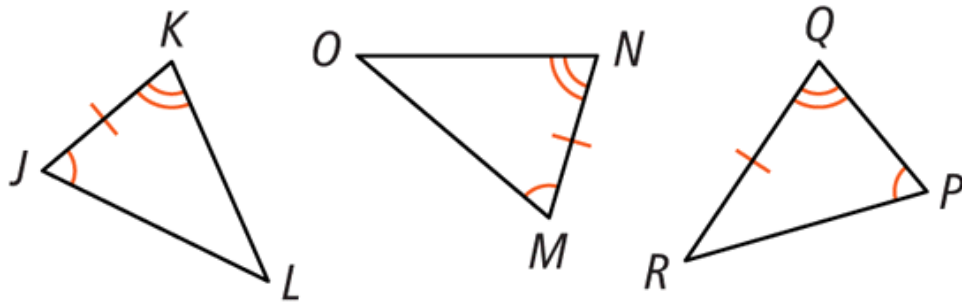Describe the series of rigid motions that need to occur to show that ΔJKL≅ ΔMNO.

EXAMPLE 3

A technician installs cables from a cell phone tower to the ground. To pass inspection, both cables must be the same length. Does this installation meet the cable-length requirement? Explain.
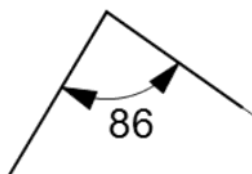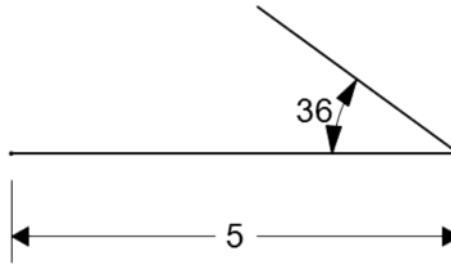
Which, if any, of the following triangles are congruent?
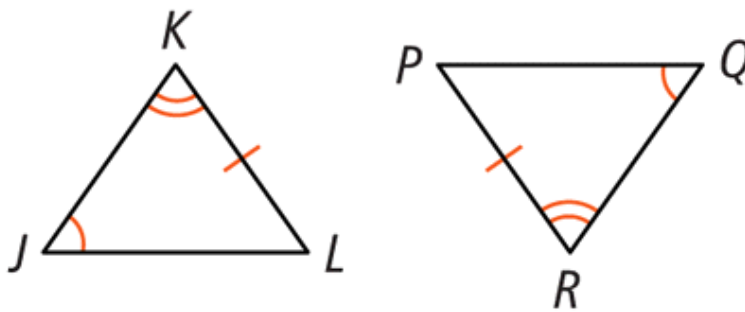Explain why they are, or why they are not.

Example 4

If we are given two angles and an attached side length, how many different triangles can we create?

86

The diagram shows a triangle with a $36°$ angle and a base of length 5.

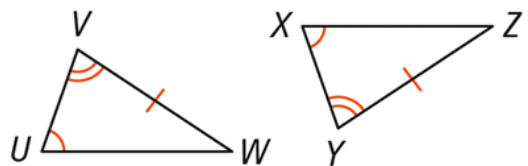Describe the series of rigid motions that need to occur to show that ΔJKL≅ ΔMNO.

Angle-Angle-Side (AAS) Congruence Criterion

If two angles and a nonincluded side of one triangle are congruent to two angles and a nonincluded side of another triangle, then the two triangles are congruent.
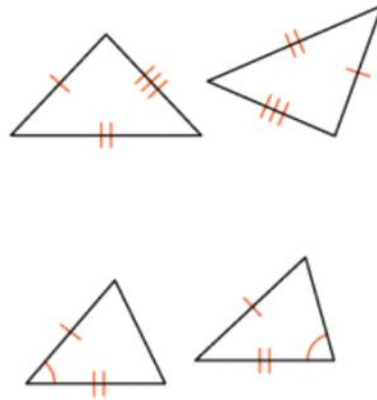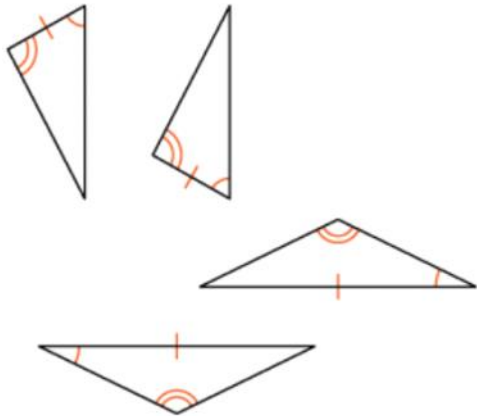
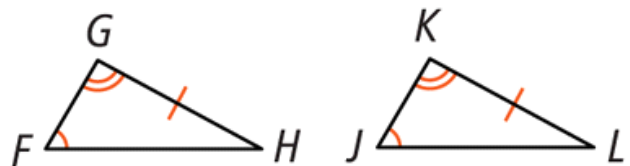**PROOF: SEE EXERCISE 16.**

If...

Then... △UVW ≅ △XYZ

EXAMPLE 5

State whether each pair of triangles is congruent by SAS, SSS, ASA, or AAS, or if the congruence cannot be determined.

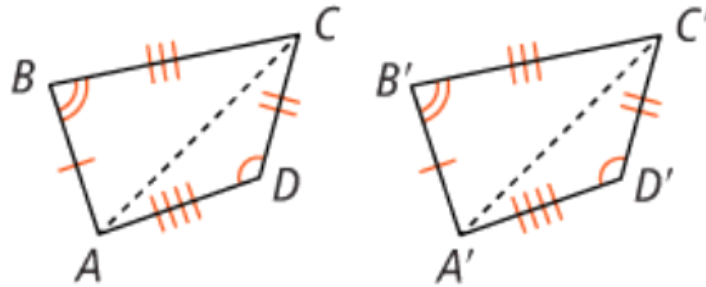**Given:** $\overline{GH} \cong \overline{KL}$, $\angle GFH \cong \angle KJL$, and $\angle FGH \cong \angle JKL$
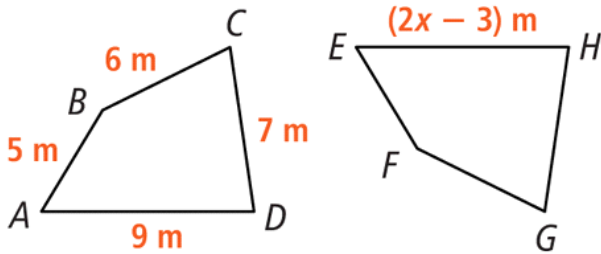
Prove: $\overline{FH} \cong \overline{JL}$

Example 6

All sides and angles of ABCD are congruent to the corresponding sides and angles of A'B'C'D'. Is ABCD congruent to A'B'C'D'?

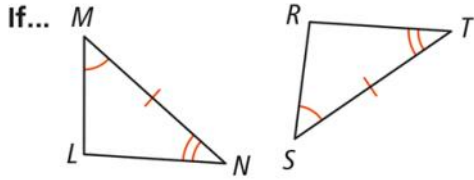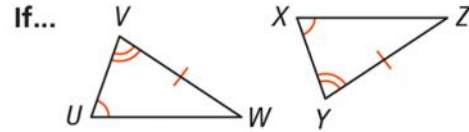Given that ABCD≅ EFGH, what is the value of x?

Triangle Congruence

THEOREM 4-6 ▶ Angle-Side-Angle (ASA)

If...

$\overline{MN} \cong \overline{ST}$, $\angle M \cong \angle S$, and $\angle N \cong \angle T$

Then... $\triangle MLN \cong \triangle SRT$

THEOREM 4-7 ▶ Angle-Angle-Side (AAS)

If...

$\overline{VW} \cong \overline{YZ}$, $\angle U \cong \angle X$, and $\angle V \cong \angle Y$

Then... $\triangle UVW \cong \triangle XYZ$

Homework

Pg. 180 (If the problem asks for a proof, do any type.)
11, 12, 15-18, 20, 21, 24