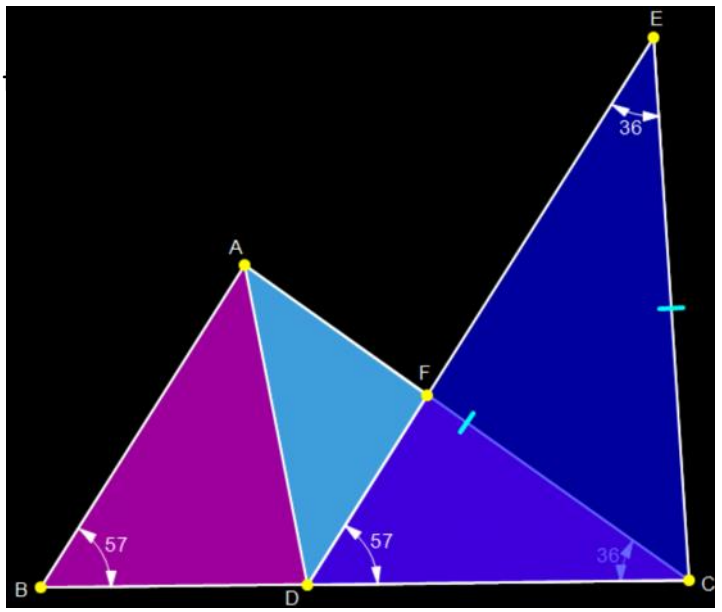
4.6 Congruence in Overlapping Triangles

Monday, September 23, 2019 7:46 AM

Warm Up

Are any of the following



Essential Question

Which theorems can be used to prove that two overlapping triangles are congruent?

Goal: "I can. . .

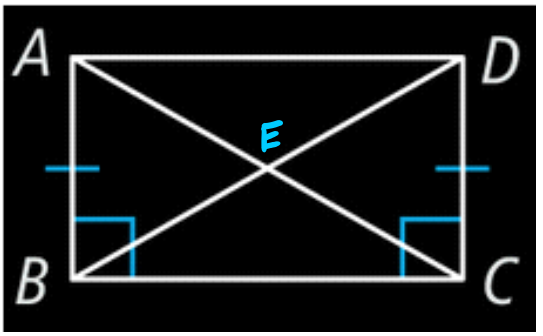
Use triangle congruence to solve problems with overlapping triangles."

How many triangles can you find?

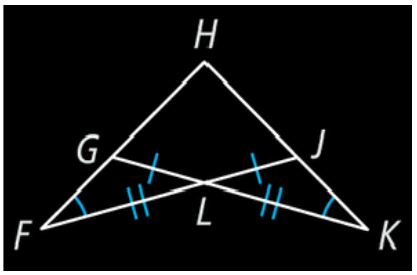
How many triangles can you find?

Example 1

Figure ABCD is a rectangle with diagonals $\overline{AC}$ and $\overline{BD}$. Why is it important to identify corresponding parts of overlapping triangles?

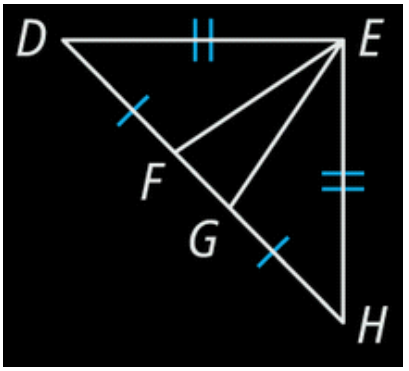


What are the corresponding sides and angles of ΔFHJ and ΔKHG?

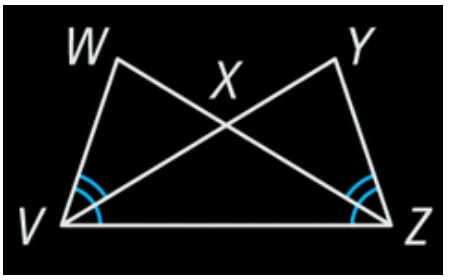


Example 2

Is $\angle EGD \cong \angle EFH$?



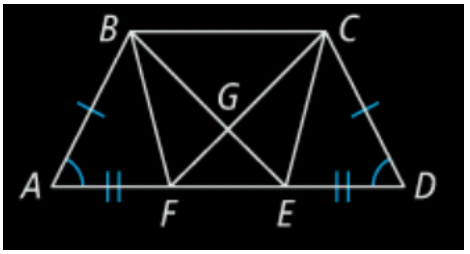
Are $\overline{VW}$ and $\overline{ZY}$ congruent?



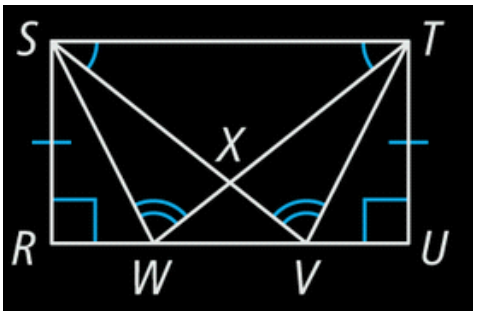
Example 3

Given: $\overline{AB} \cong \overline{DC}$, $\overline{AF} \cong \overline{DE}$, and $\angle A \cong \angle D$

Prove: $\triangle BFE \cong \triangle CEF$

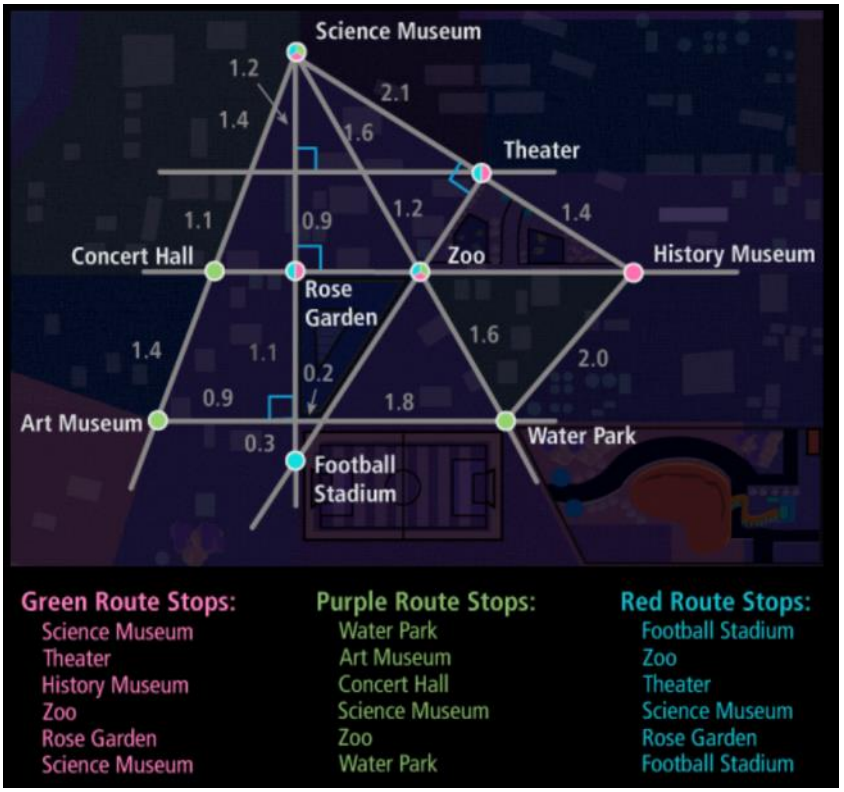


Write a proof to show that $\Delta SRV \cong \Delta TUW$.

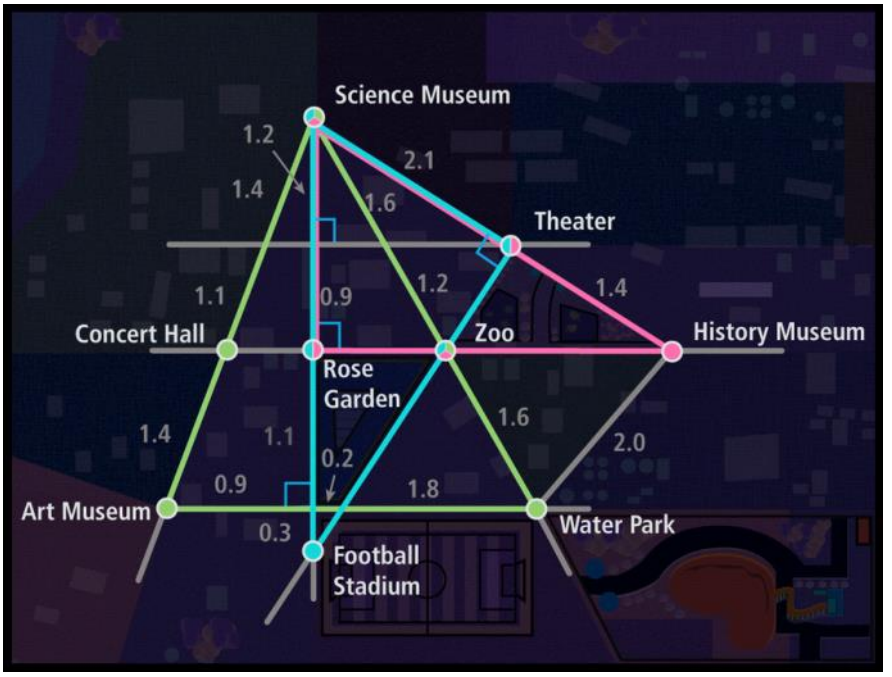


Example 4

A city runs three triangular bus routes to various attractions. How can you draw a separate triangle for each route? Are any of the routes the same length?



A new route will stop at the History Museum, Water Park, Zoo, Science Museum, and Theater. Draw a triangle to represent the new route. Include any length or angle information that is given in the diagram.



Congruence in Overlapping Triangles

All congruence criteria can be applied to overlapping triangles.

THEOREM 4-4

Side-Side-Side (SSS)

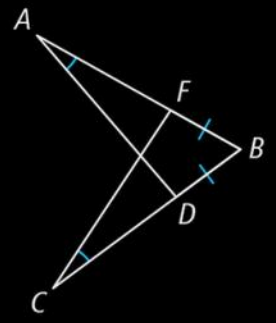
If...

Then... $\triangle KLM \cong \triangle MJK$ and $\triangle LMJ \cong \triangle JKL$

THEOREM 4-6

Angle-Angle-Side (AAS)

If...

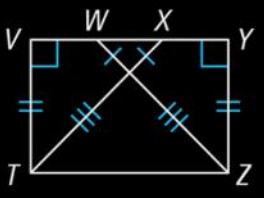


Then... $\triangle ABD \cong \triangle CBF$

THEOREM 4-7

Hypotenuse-Leg (HL) Theorem

If...



Then... $\triangle VXT \cong \triangle YWZ$

Homework

Pg. 192
12, 13, 16-21, 27, 28