Congruent Triangles: SSS and SAS Theorems - Guided Lesson Explanation
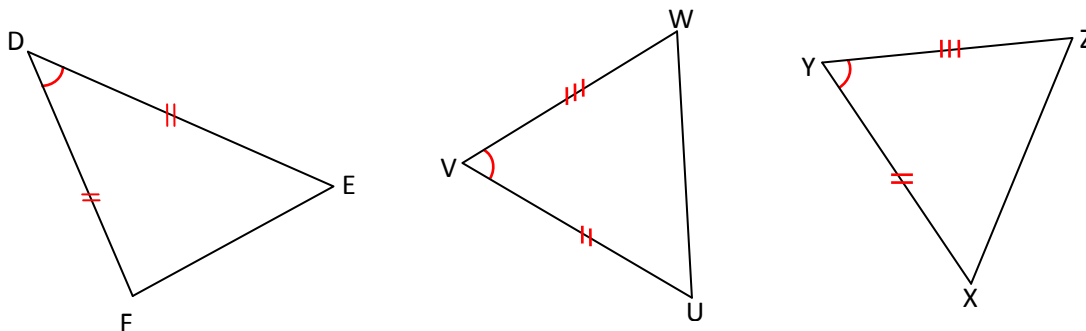
Explanation#1

SAS (side-angle-side)

Two sides and the angle between them are congruent

The SAS Theorem states that two triangles are congruent if and only if two sides and the included angle of one triangle are congruent to two sides and the included angle of the other triangle.

Find the two triangles with two pairs of congruent sides and congruent included angles.

$\overline{VU} \cong \overline{YX}$ side

$\angle V \cong \angle Y$ Angle

$\overline{WV} \cong \overline{YX}$ side

Two sides and the included angle of Δ VUW are congruent to two sides and the included angle of ΔYXZ, so these triangles are congruent by the SAS theorem.

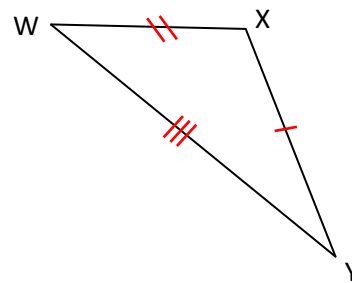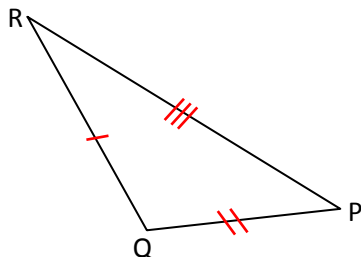To write the congruence statement, match the corresponding vertices. Since ∠V ≅ ∠Y, V corresponds to Y. Also, since the side opposite W corresponds to the side opposite Z, W corresponds to Z. Similarly, U corresponds to X. so, ΔWUV ≅ ΔZXY.

Explanation#2

$\overline{QP} \cong \overline{XW}$ side

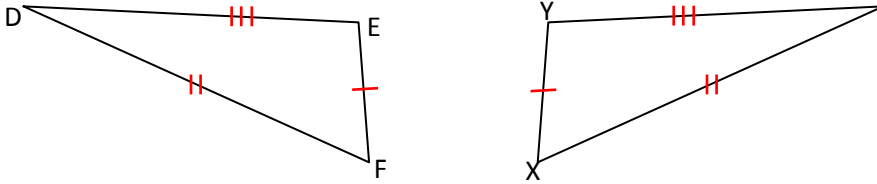$\overline{RQ} \cong \overline{YX}$ side

$\overline{RP} \cong \overline{WY}$ side

The three sides of ΔQPR are congruent to the three sides of ΔYWX, so these triangle are congruent by the SSS Theorem.

To write the congruence statement, match the corresponding vertices. Since the side opposite Q corresponding to the side opposite X, Q corresponding to X. Similarly, R corresponds to Y and P corresponds to W. So ΔQPR ≅ ΔWYX.

Explanation#3

The SSS Theorem states that two triangles are congruent if and only if the three sides of one triangle are congruent to the three sides of the other triangle. Find the two triangles with three pairs of congruent sides.

$\overline{EF} \cong \overline{XY}$ side

$\overline{DF} \cong \overline{ZX}$ side

$\overline{ED} \cong \overline{YZ}$ side

The three sides of ΔFDE are congruent to the three sides of ΔXZY, so these triangle are congruent by the SSS Theorem.

To write the congruence statement, match the corresponding vertices. Since the side opposite E corresponding to the side opposite Y, E corresponding to Y. Similarly, D corresponds to Z and F corresponds to X. So ΔDEF ≅ ΔZYX.