SSS hint-through…

Given ΔABC and ΔDEF such that $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$ and $\overline{AC} \cong \overline{DF}$

Construct a triangle (using theorems 13 and then 12) ΔGEF such that $\Delta ABC \cong \Delta GEF$ by SAS and G is on the opposite side of $\overleftrightarrow{EF}$ from D.

Use congruent triangles and algebra to prove that $\overline{DE} \cong \overline{GE}$ and $\overline{DF} \cong \overline{GF}$

Notice that there are three ways that $\overline{DG}$ can intersect $\overleftrightarrow{EF}$:

Case 1: $\overline{DG}$ contains either E or F . We may assume without loss in generality that $E \in \overline{DE}$	Case 2: $\overline{DG} \cap \overline{EF} = P$ and $P \neq E$ or F	Case 3: $\overline{DG} \cap \overleftrightarrow{EF} = Q$ but $Q \notin \overline{EF}$. We may assume without loss in generality that $Q \in \overrightarrow{FE}$

For each case:

First use a theorem to prove something about ΔFDG

Then use the same theorem to prove something about ΔEDG (unless this is case 1 and ΔEDG isn't a triangle)

Now some algebra and maybe an axiom to prove something about the angles $\angle EDF$ and $\angle EGF$

Then use a theorem to prove that $\Delta DEF \cong \Delta GEF$