1. $\overline{AC} \cong \overline{DC}$ and $\overline{BC} \cong \overline{CE}$. Prove $\triangle ABC \cong \triangle DEC$.

2. $\overline{AC} \cong \overline{DC}$ and $\overline{BA} \cong \overline{ED}$. Prove $\triangle ABC \cong \triangle DEC$.

3. Write a flow proof, a two column proof, or a paragraph proof.
   Given: $\overline{QO} \perp \overline{PO}$, $\overline{NO} \perp \overline{PO}$, and $\overline{NO} \cong \overline{QO}$. Prove $\triangle QOP \cong \triangle NOP$.

4. Write a two-column proof.
   Given: $\overline{AB} \cong \overline{CD}$, $\angle A \cong \angle D$, and $\overline{AF} \cong \overline{DE}$. Prove $\triangle FAC \cong \triangle EDB$. 
5. Prove that \( \triangle ABC \cong \triangle CDA \).

\[ \begin{align*}
A &\quad 6 \\
B &\quad 4 \\
C &\quad 2 \\
D &\quad 2 \\
\end{align*} \]

6. Write a two-column proof.

Given: \( \angle A \cong \angle X, \quad \angle B \cong \angle Y, \quad BC \cong YZ \)

Prove: \( \triangle ABC \cong \triangle XYZ \)

\[ \begin{align*}
A &\quad X \\
B &\quad Y \\
C &\quad Z \\
\end{align*} \]

7. The diagram shows visible light waves(F), ultraviolet light(G), and X-rays(H). Outline a proof that triangles I and II are congruent, given \( \angle 1 \cong \angle 4 \).

\[ \begin{align*}
F &\quad G \\
H &\quad I \quad \text{II} \\
2 &\quad 3 \\
\end{align*} \]

8. Write the inverse of Postulate 8.1: If three sides of one triangle are congruent to three sides of another triangle, then the two triangles are congruent. Use it to show that if \( \triangle A'B'C' \) is the image of \( \triangle ABC \) under a dilation with scale factor 2, then \( \triangle A'B'C' \) and \( \triangle ABC \) are not congruent.
[1] \( \angle ACB \cong \angle DCE \) because they are vertical angles. So \( \triangle ABC \cong \triangle DEC \) by SAS.

[2] \( \angle A \cong \angle D \) because they are base angles of isosceles \( \triangle CAD \). So \( \triangle ABC \cong \triangle DEC \) by SAS.

Check students' work. They should show that \( \angle NOP \) and \( \angle QOP \) are right angles and that they are congruent. Because \( NO \cong QO \) and \( PO \cong PO \), the triangles are congruent by SAS.

[3] Check students' work. They should show that \( \overline{AC} \cong \overline{BD} \) by adding \( BC \) to \( AB \) and \( CD \) and then using SAS.

[4] \( BC \parallel AD \) since they have the same slope. So, \( \angle BCA \cong \angle DAC \) by the Alt. Int. Angles Post. Similarly, \( AB \parallel DC \) since they have the same slope. So, \( \angle BAC \cong \angle DCA \). \( \overline{AC} \cong \overline{CA} \), so the triangles are congruent by ASA. Other congruence strategies would also work.

[5] Check students' work. Use AAS.

Because the triangles are isosceles, \( \angle 1 \cong \angle 2 \) and \( \angle 3 \cong \angle 4 \). Since the base of the triangles is congruent to itself, the triangles are congruent by ASA.

[6] If three sides of one triangle are not congruent to three sides of another triangle, then the two triangles are not congruent. Under the dilation, each side in \( \triangle A'B'C' \) would be twice the length of the corresponding side in \( \triangle ABC \), so the sides are not congruent. Hence, the triangles are not congruent.