

Triangle Congruency ***KEY***

State the triangle proof, if there is one, that can be used to prove the two triangles in the diagram are congruent. If there is a pair of congruent corresponding parts that are not stated explicitly, also state that congruency.

1. Yes, by SSS.
2. None, as the corresponding congruent parts make ASS, which is not a triangle congruency proof. They MAY be congruent, but do not HAVE to be congruent.
3. Yes, by SAS.
4. None, as the corresponding congruent parts make AAA, which is a similarity proof, but does not prove congruence.
5. Yes, by SAS. $\angle AEB \cong \angle DEC$ because they are vertical angles formed when \overline{AC} intersects \overline{BD} .
6. Yes, by ASA. $\angle AEB \cong \angle DEC$ because they are vertical angles formed when \overline{AC} intersects \overline{BD} .
7. None. The vertical angles at E are congruent, but that would make ASS, which does not prove congruency.
8. Yes, by SAS when you consider the vertical angles at E ($\angle AEB \cong \angle DEC$).
9. Yes, by SSS. \overline{AC} is a shared side for the two triangles.
10. Yes, by SAS. \overline{AC} is a shared side for the two triangles.
11. None. The shared side (\overline{AC}) would make ASS, which does not prove congruency.
12. Yes, by SAS. Consider the shared side (\overline{AC}), and then $\overline{AD} \parallel \overline{BC}$ makes $\angle BCA$ and $\angle DAC$ alternate interior angles that have to be congruent.
13. Yes, by SSS. Since \overline{CD} is a shared side.
OR
Yes, by SAS since $AC = BC$, this is an isosceles triangle so $\angle A$ has to be congruent to $\angle B$.
14. Yes, by SAS. $AD = BD$ since D is the midpoint of \overline{AB} . $CD \perp \overline{AB}$ means that both angles at D are congruent (90°). Also do not forget that \overline{CD} is a shared side.
15. Yes, by ASA. \overline{CD} is a shared side. $\overline{AB} \perp \overline{CD}$ means that both angles at D are congruent (90°). \overline{CD} being the angle bisector means that $\angle ACD \cong \angle BCD$.
16. None. The triangles do not have more than two corresponding parts that are congruent. All the congruency proofs require three sets of corresponding parts in a particular order (SSS, SAS, ASA, or AAS).