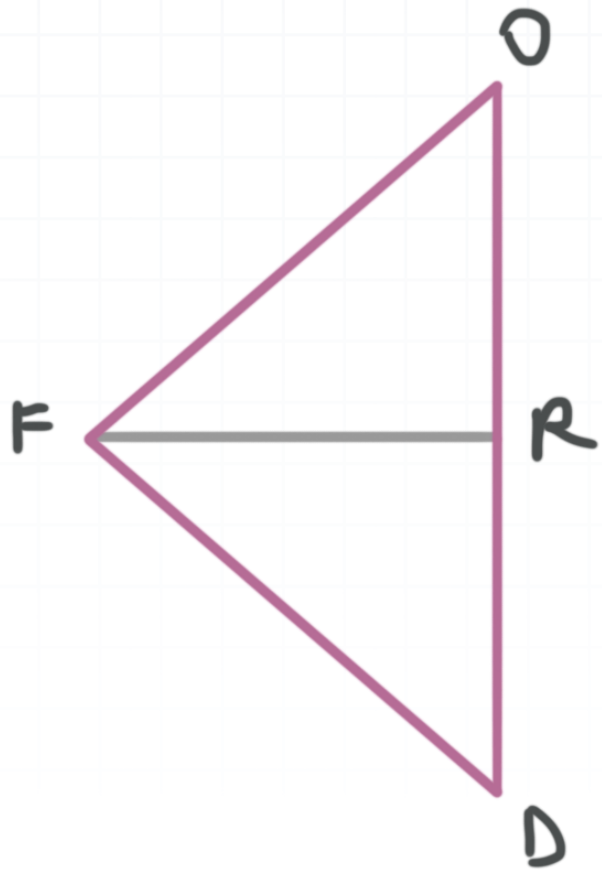
Topic: Triangle congruence with AAS, HL

Question: Given $\triangle FOR$ and $\triangle FDR$, and $\overline{FO} \cong \overline{FD}$ and $\overline{FR} \perp \overline{OD}$, which theorem would be used to prove the triangles congruent?



Answer choices:

A SAS

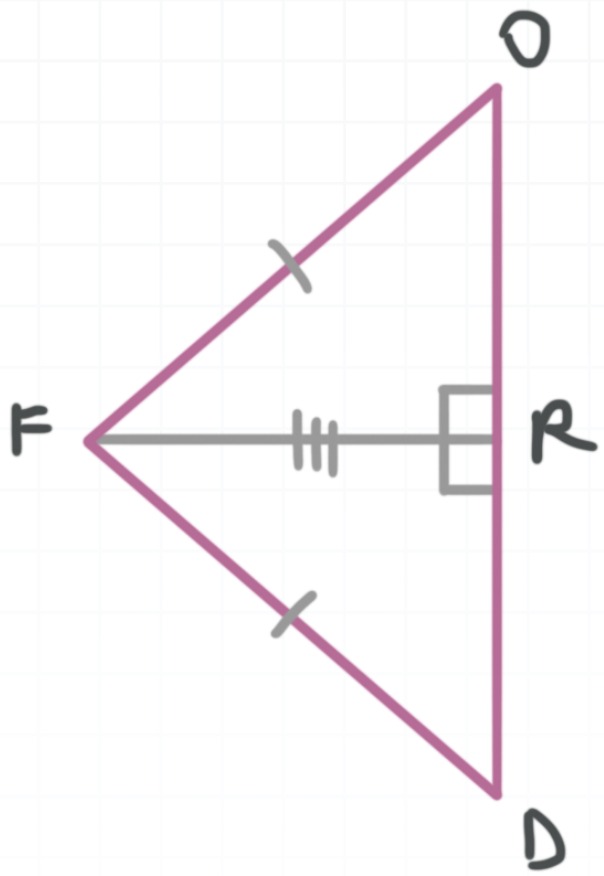
B AAS

C HL

D None of these

Solution: C

Add the information we've been given into the figure.



$\overline{FR} \perp \overline{OD}$, so $\angle ORF$ and $\angle FRD$ are right angles. It follows that $\triangle FOR$ and $\triangle FDR$ are right triangles.

Hypotenuse: $\overline{FO} \cong \overline{FD}$ because this is given information.

Leg: $\overline{FR} \cong \overline{FR}$ by the reflexive property.

This makes the triangles congruent by HL.

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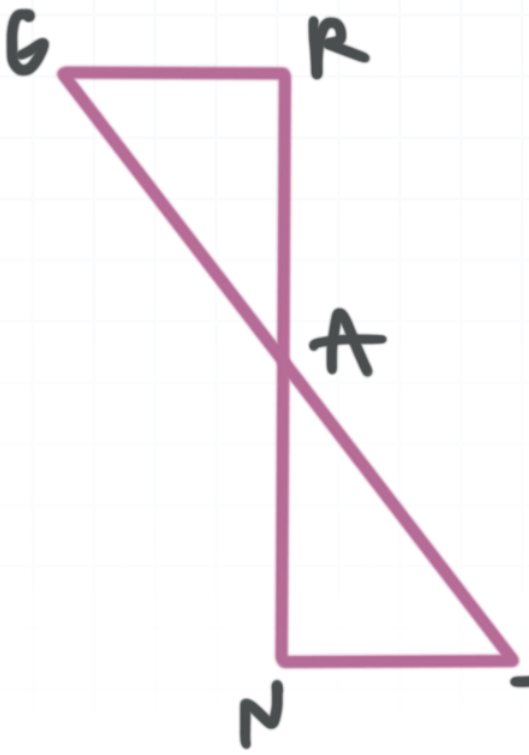
Question: Given $\triangle GRA$ and $\triangle TNA$, $\overline{GR} \cong \overline{TN}$, and the fact that $\angle GRA$ and $\angle TNA$ are right angles, which theorem would be used to prove the triangles congruent?



Answer choices:

A SAS

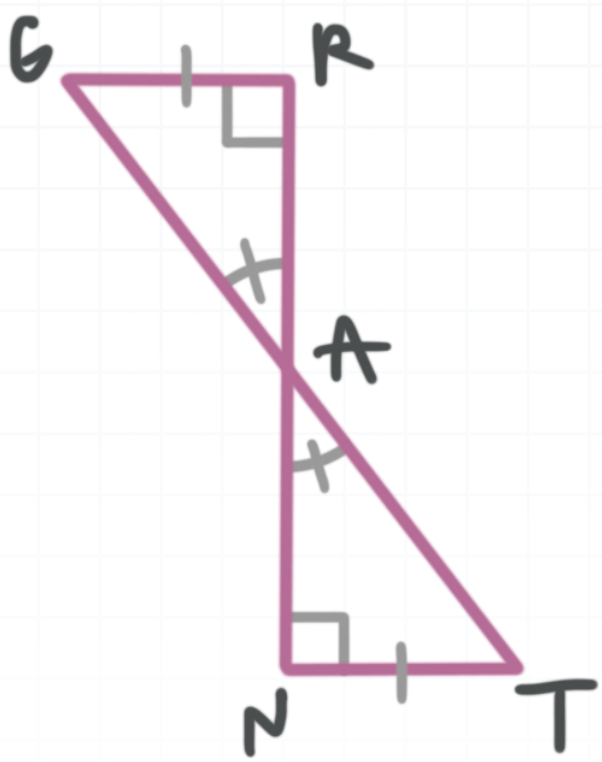
B AAS

C HL

D None of these

Solution: B

Fill out the figure with the given information.



A: $\angle GRA$ and $\angle TNA$ are right angles, so $\angle GRA \cong \angle TNA$.

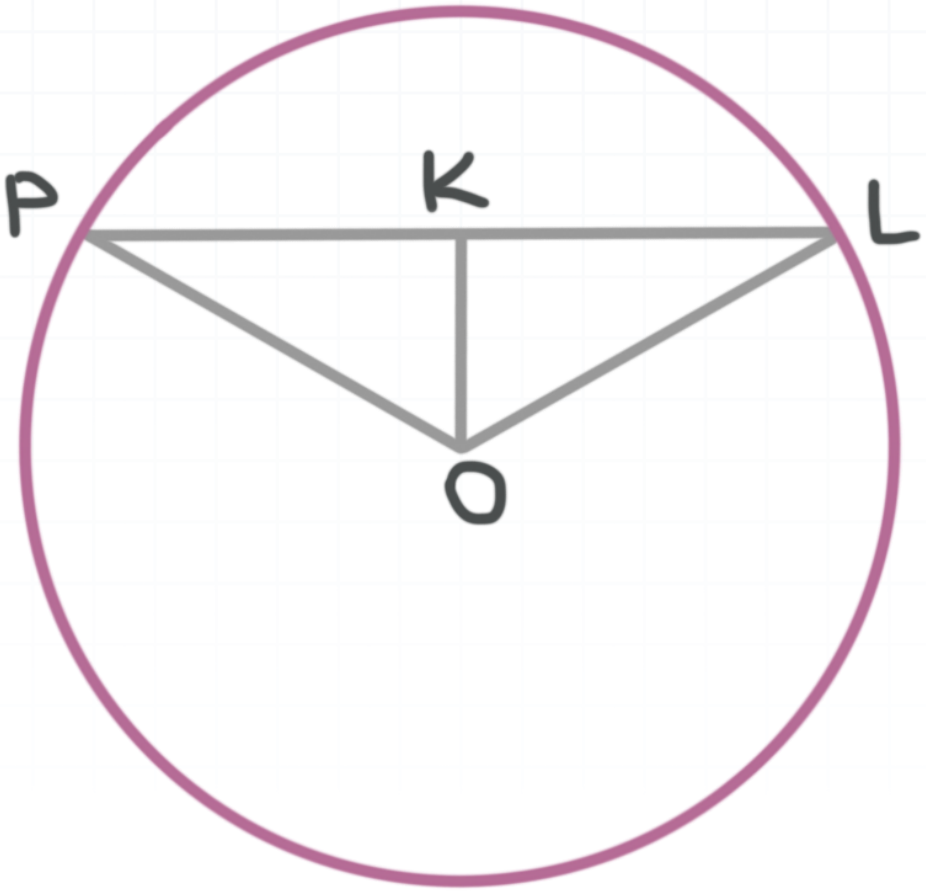
A: $\angle RAG \cong \angle NAT$ because vertical angles are congruent.

S: $\overline{GR} \cong \overline{TN}$ because this is given information.

This makes the triangles congruent by AAS: In $\triangle GRA$, $\overline{GR}$ is the side opposite $\angle RAG$ (an angle in one of the pairs of congruent angles, namely the pair $\angle RAG$ and $\angle NAT$); and in $\triangle TNA$, $\overline{TN}$ is the side opposite $\angle NAT$ (the other angle in that congruent pair).

Topic: Triangle congruence with AAS, HL

Question: In the circle with center at O, $\overline{KO}$ bisects $\angle LOP$. Which theorem would be used to prove the triangles congruent?



Answer choices:

A ASA

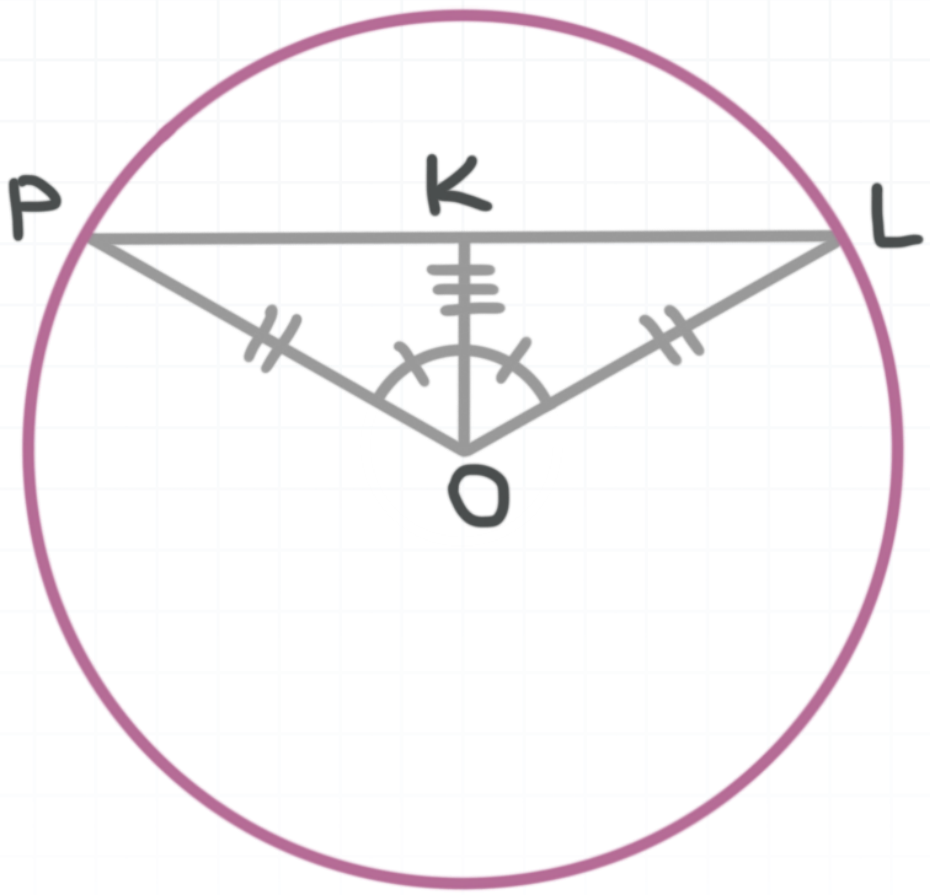
B AAS

C HL

D None of these

Solution: D

Fill in the figure with the given information.



S: $\overline{OP} \cong \overline{OL}$ because radii of a circle are congruent.

A: $\angle KOP \cong \angle LOK$ because an angle bisector forms a pair of congruent angles.

S: $\overline{KO} \cong \overline{KO}$ by the reflexive property.

This makes the triangles congruent by SAS, because $\angle KOP$ is the included angle of sides $\overline{KO}$ and $\overline{OP}$ in $\triangle KOP$, and $\angle LOK$ is the included angle of sides $\overline{KO}$ and $\overline{OL}$ in $\triangle KOL$. However, SAS isn't one of the answer choices.

It looks as though $\overline{KO} \perp \overline{PL}$. If that were the case, then answer choices A and C are both correct:

- answer choice A (ASA) because $\overline{KO}$ is the included side for $\angle KOP$ and $\angle PKO$ in $\triangle KOP$, and $\overline{KO}$ is also the included side for $\angle LOK$ and $\angle OKL$ in $\triangle KOL$

- answer choice C (HL) because $\overline{OP}$ and $\overline{KO}$ are the hypotenuse and one leg, respectively, of $\triangle KOP$; $\overline{OL}$ and $\overline{KO}$ are the hypotenuse and the corresponding leg, respectively, of $\triangle KOL$; and $\overline{OP} \cong \overline{OL}$

However, we haven't been told that $\overline{KO} \perp \overline{PL}$, so we can't be sure that that's true. Therefore, "None of these" is the only answer choice that follows from the given information (and nothing more).