Geometry Journal: Congruency Proofs
www.jmap.org

NAME:_____

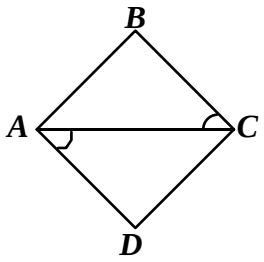
P.I. G.G.28: Determine the congruence of two triangles by using one of the five congruence techniques (SSS, SAS, ASA, AAS, HL), given sufficient information about the sides and/or angles of two congruent trieangles

1. Given ΔABC, describe how to construct a triangle congruent to ΔABC using the SAS postulate. Then describe how to construct a triangle congruent to ΔABC using the SSS postulate.

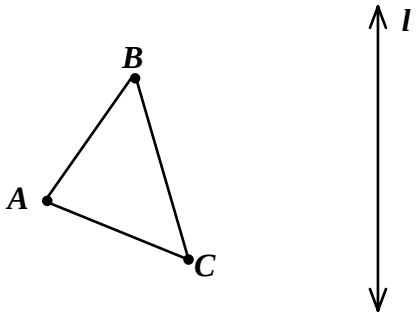
2. Give an example of two triangles in which two sides and an angle are congruent, but the triangles are not congruent.

3. A pyramid has a base that is a regular octagon, and the triangular faces are isosceles triangles. Identify three ways you can prove the triangular faces congruent.

4. Explain why ΔABC cannot be shown to be congruent to ΔCDA.



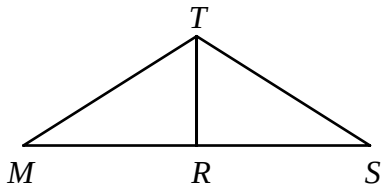
5. Sketch the image of ΔABC after a reflection in line l. How can you prove the two triangles are congruent?



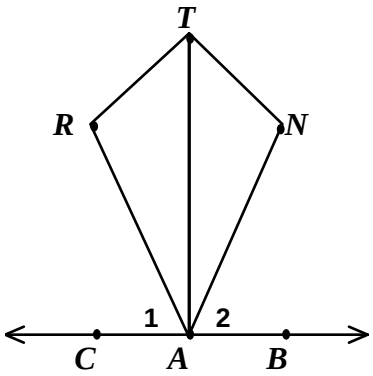
NAME:_____

6. Given: R is the midpoint of $\overline{MS}$
   $\overline{TR} \perp \overline{MS}$

   Outline a proof that shows: $\overline{TM} \cong \overline{TS}$



7. Outline a plan for proving that $\overline{RT} \cong \overline{NT}$ if $\overline{AN} \cong \overline{AR}$, $\overline{AT} \perp \overline{CB}$, and $\angle 1 \cong \angle 2$.



8. Make up a problem that involves congruent triangles and CPCTC. Include your solution.

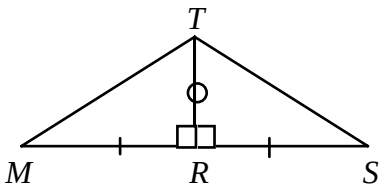
[1] Using SAS, copy side $\overline{AB}$; then copy $\angle A$ at one end and copy $\overline{AC}$ along that line. Using SSS, copy one side, and from each endpoint, make an arc using the other sides as radii. Connect the point of intersection of the arcs to form the triangle.

[2] Check students' work.

[3] For example, the bases and sides of the triangles are congruent, so you can use SSS. Or, the base angles are congruent, so you can use ASA. Or, you can prove the nonbase angles are congruent, as are the base angles, so you can use AAS.

[4] Although $\angle CAD \cong \angle ACB$ and $\overline{AC}$ is congruent to itself, we do not have any other information. To prove the triangles are congruent, we would need to know that one other pair of sides or one other pair of angles was congruent.

[5] Check students' work.



[6] $\Delta TMR \cong \Delta TSR$ by the *SAS* congruency postulate
$\overline{TM} \cong \overline{TS}$ by *CPCTC*

[7] Because $\overline{AT} \perp \overline{CB}$, we know $\angle CAT$ and $\angle BAT$ are right angles and therefore congruent. By the Subtraction Prop., we know $\angle RAT \cong \angle NAT$. $\overline{TA}$ is congruent to itself and $\overline{AN} \cong \overline{AR}$. So, ΔTRA and ΔTNA are congruent by SAS. Thus $\overline{RT} \cong \overline{NT}$ by CPCTC.

[8] Check students' work.