Name Answers Date

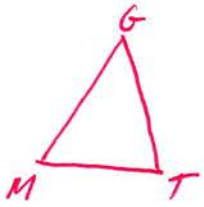
4.3 – Triangle Congruence by SSS and SAS

Draw ΔMGT. Use the triangle to answer the questions below.

1) What angle is included between $\overline{GM}$ and $\overline{MT}$? $\angle M$

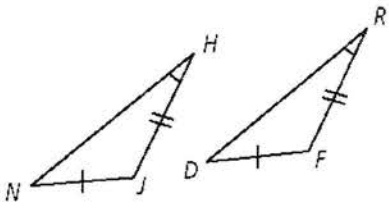
2) Which sides include $\angle T$? $\overline{GT}$ and $\overline{TM}$

3) What angle is included between $\overline{GT}$ and $\overline{MG}$? $\angle G$



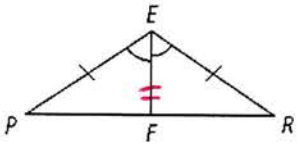
Would you use SSS or SAS to prove the triangles congruent? If there is not enough information to prove the triangles congruent by SSS or SAS, write *not enough information.*

4)



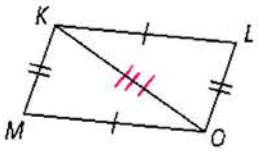
Not enough info. Angle not in between ≅ sides.

5)



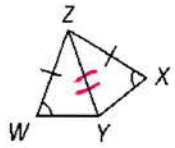
SAS

6)



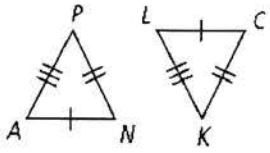
SSS

7)



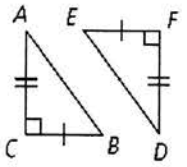
Not enough info Angle not in between ≅ sides

8)



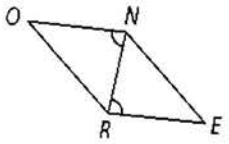
SSS

9)



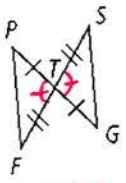
SAS

10)



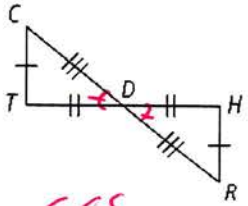
Not enough info

11)



SAS

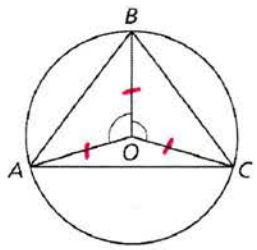
12)



SSS or SAS

Use the given information to **name** two congruent triangles. **Explain** your reasoning. (What's congruent or not…etc.)

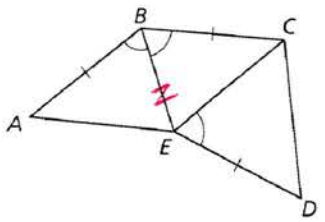
13)



All radii are $\cong$ in a circle.

$\Delta AOB \cong \Delta COB$

14)



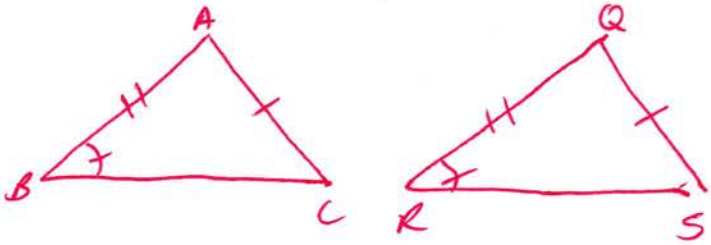
$\Delta ABE \cong \Delta CBE$

15) Draw a Diagram A student draws ΔABC and ΔQRS. The following sides and angles are congruent:

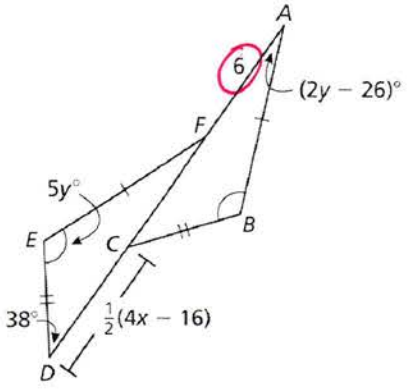
$\overline{AC} \cong \overline{QS}$ $\overline{AB} \cong \overline{QR}$ $\angle B \cong \angle R$

Based on this, can the student use either SSS or SAS to prove that $\Delta ABC \cong \Delta QRS$? If the answer is no, explain what additional information the student needs. Use a sketch to help explain your answer.

No. the $\cong$ angles have to between the $\cong$ sides.



16) Use the information given in the figure to find the values of x and y.



$\frac{1}{2}(4x - 16) = 6$

$2x - 8 = 6$

$2x = 14$

$\boxed{x = 7}$

$5y + (2y - 26) + 38 = 180$

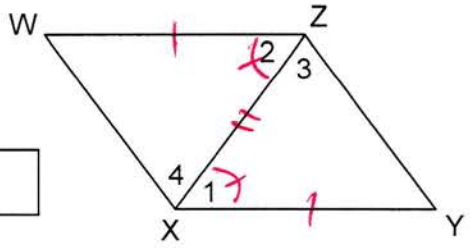
$7y + 12 = 180$

$7y = 168$

$\boxed{y = 24}$

17) Use the information to complete the following flow chart proof.

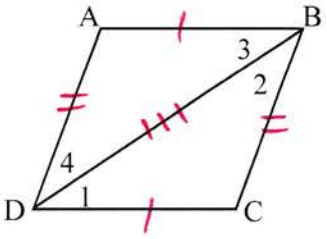
1. $\overline{XY} \cong \overline{ZW}$
2. Given
3. $\angle 1 \cong \angle 2$
4. Given
5. $\overline{ZX} \cong \overline{ZX}$
6. Reflexive Prop
7. $\Delta WZX \cong \Delta YXZ$
8. SAS



Given: $\overline{XY} \cong \overline{ZW}$; $\angle 1 \cong \angle 2$
Prove: $\Delta WZX \cong \Delta YXZ$

18) Use the information to complete the following flow chart proof.

1. $\overline{AB} \cong \overline{CD}$
2. Given
3. $\overline{BC} \cong \overline{DA}$
4. Given
5. $\overline{BD} \cong \overline{BD}$
6. Reflexive Prop.
7. $\Delta ABD \cong \Delta CDB$
8. SSS

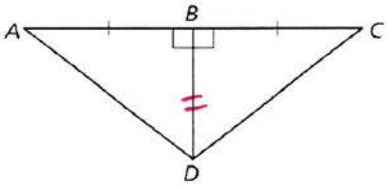


Given: $\overline{AB} \cong \overline{CD}$; $\overline{BC} \cong \overline{DA}$
Prove: $\Delta ABD \cong \Delta CDB$

Complete the following two-column proofs

19) Given: $\angle ABD$ and $\angle CBD$ are right angles and $\overline{BD}$ bisects $\overline{AC}$.

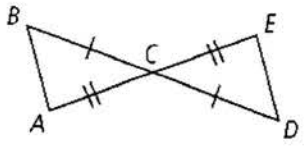
Prove: $\Delta ABD \cong \Delta CBD$



Statement	Reasons
1. $\angle ABD$ and $\angle CBD$ are right angles	Given
2. $m\angle ABD = 90°$ and $m\angle CBD = 90°$	Definition of Right Angles
3. $m\angle ABD = m\angle CBD$	Substitution Prop.
4. $\angle ABD \cong \angle CBD$	Def. of Congruency
5. $\overline{AB} \cong \overline{CB}$	Definition of a Bisector
6. $\overline{BD} \cong \overline{BD}$	Reflexive Prop.
7. $\Delta ABD \cong \Delta CBD$	SAS

20) Given: $\overline{BC} \cong \overline{DC}, \overline{AC} \cong \overline{EC}$

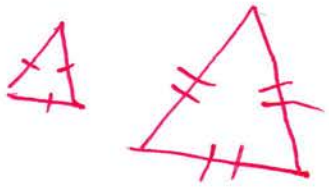
Prove: $\Delta ACB \cong \Delta ECD$



Statement	Reasons
$\overline{BC} \cong \overline{DC}$	Given
$\overline{AC} \cong \overline{EC}$	Given
$\angle BCA \cong \angle DCE$	VA
$\Delta ACB \cong \Delta ECD$	SAS

21) ΔFGH and ΔPQR are both equilateral triangles. Your friend says this means they are congruent by the SSS Postulate. Is your friend correct? Explain.

Incorrect. Even though they are equilateral nothing is said about sides being congruent between the triangles.



22) A student is gluing same-sized toothpicks together to make triangles. She plans to use these triangles to make a model of a bridge. Will all the triangles be congruent? Explain your answer.

Yes. they all will be congruent equilateral triangles since they are all made from the same sized toothpicks.