## 4-5

## Triangle Congruence by SSS and SAS

1. to apply the SSS and SAS postulates in problem solving
2. to prove two triangles congruent using the SSS and SAS Postulates

## KEY CONCEPT

If the three sides of one triangle are congruent to the three sides of another triangle, then the two triangles are congruent.


## KEY CONCEPT

If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then the two triangles are congruent.


If $\overline{A B} \cong \overline{D E}, \quad \angle B \cong \angle E$, and $\overline{B C} \cong \overline{E F}$, then $\triangle \mathrm{ABC} \cong \triangle D E F$.

Side-AngleSide (SAS) Postulate

## CLASS WORK

## Draw $\triangle M G T$. Use

 the triangle to answer the questions.

1. What angle is included between $\overline{G M}$ and $\overline{M T}$ ?

$$
\angle M
$$

2. Which sides include $\angle T$ ?

$$
\overline{G T} \text { and } \overline{M T}
$$

3. What angle is included between $\overline{G T}$ and $\overline{M G}$ ?
$\angle G$

## CLASS WORK

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. Explain your answer.
4.


$$
\overline{E F} \approx \overline{E F} \not \text { Reflex-propof }=
$$

5. 



## CLASS WORK

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. Explain your answer.
not enough info.
6.
7.

SSS



## CLASS WORK

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. Explain your answer.
8.


F

## CLASS WORK

9. A student draws $\triangle A B C$ and $\triangle Q R S$. The following sides and angles are congruent:
$\overline{A C} \cong \overline{Q S}, \angle B \cong \angle R, \overline{A B} \cong \overline{Q R}$

Based on this, can the student use either SSS or SAS to prove that $\triangle A B C \cong \triangle Q R S$ ?
no


## CLASS WORK

10. Given: $\overline{B C} \cong \overline{D C}, \overline{A C} \cong \overline{E C}$

Prove: $\triangle A B C \cong \triangle E D C$


## Statements

1. $\overline{B C} \cong \overline{D C}, \overline{A C} \cong \overline{E C}$
2. $\angle B C A \cong \angle D C E$
3. $\triangle A B C \cong \triangle E D C$
4. Given
5. Vertical angles are congruent
6. SAS Postulate

## CLASS WORK

11. Given: $\quad \overline{W X} \| \overline{Y Z}, \overline{W X} \cong \overline{Y Z}$ Prove: $\triangle W X Z \cong \triangle Y Z X$


Statements

1. $\overline{W X} \| \overline{Y Z}, \overline{W X} \cong \overline{Y Z}$
2. $\angle W X Z \cong \angle \mathrm{YZX}$
3. $\overline{Z X} \cong \overline{Z X}$
4. $\triangle W X Z \cong \triangle Y Z X$

Reasons

1. Given
2. Alternate interior angles theorem
3. Reflexive property of $\cong$
4. SAS Postulate

## EXIT PROBLEM

Given: $\overline{B D}$ is the perpendicular bisector of $\overline{A C}$.
Prove: $\triangle B A D \cong \triangle B C D$


## Statements

## Reasons



## Statements

1) $\overline{B D}$ is the perpendicular bisector of $\overline{A C}$
2) $\overline{A D} \cong \overline{C D}$
3) $\angle A D B$ and $\angle C D B$ are right angles.
4) $\angle A D B \cong \angle C D B$
5) $\overline{D B} \cong \overline{D B}$
6) $\triangle B A D \cong \triangle B C D$

## Reasons

1) Given
2) Definition of bisector
3) Definition of $\perp$
4) All right angles are congruent.
5) Reflexive property of $\cong$
6) SAS Postulate

Two prove triangles congruent yo can have:

1. Three sides (SSS)
2. Two sides and the included angle (SAS)

SUMMARY

## LEARNING RUBRIC

- Got It: Proves congruent triangles using proofs with complex diagrams/less direct congruence given
- Almost There: Proves congruent triangles using proofs with simple diagrams/mostly direct congruence given
- Moving Forward: Informally identifies the reason for congruent triangles
- Getting Started: Identifies included angles


## HOMEWORK

Pages 254-256
8-20 even;
21, 28, 30

## answer slide

1) $\angle M$
2) $\overline{M T}$ and $\overline{G T}$
3) $\angle G$
4) SAS Postulate; $\triangle P E F \cong \triangle R E F$
5) not enough information
6) SSS Postulate; $\triangle P A N \cong \triangle K L C$
7) not enough information
8) SAS Postulate; $\triangle P T F \cong \triangle G T S$
9) No
10) See slides for proofs
