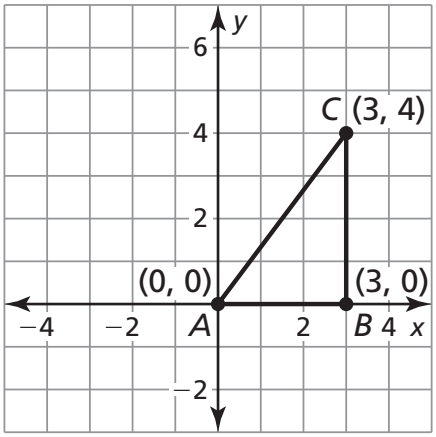
5.3 Start Thinking

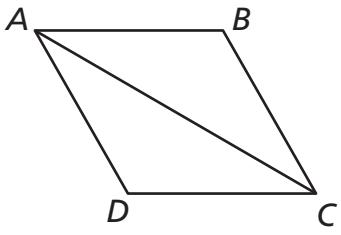
Connect the points to make $\triangle ABC$. Plot D and E in Quadrant II so that $\overline{AB} \cong \overline{AD}$, $\overline{BC} \cong \overline{DE}$, and $\angle ABC \cong \angle ADE$. Connect the points to make $\triangle ADE$. Is $\triangle ABC \cong \triangle ADE$? If so, is there any other information needed to prove the congruence? Why or why not?



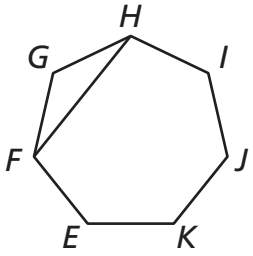
5.3 Warm Up

Name the diagonal segment in the figure.

1.

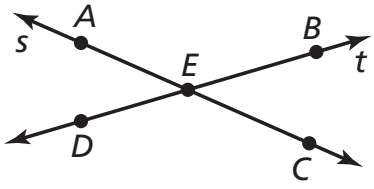


2.



5.3 Cumulative Review Warm Up

Use the diagram.



1. What is another name for $\overline{DE}$?

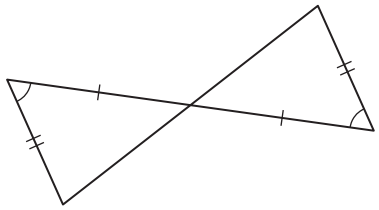
2. What is another name for $\overline{CE}$?

Name _____ Date _____

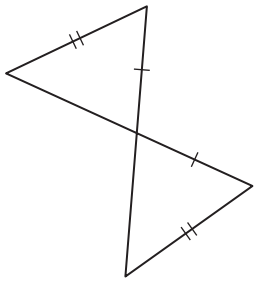
5.3 Practice A

In Exercises 1 and 2, decide whether enough information is given to prove that the triangles are congruent using the SAS Congruence Theorem (Theorem 5.5). Explain.

1.

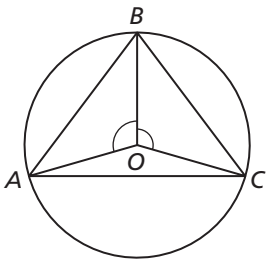


2.

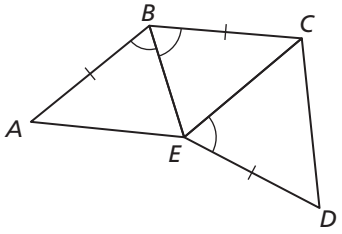


In Exercises 3 and 4, use the given information to name two congruent triangles. Explain your reasoning.

3.



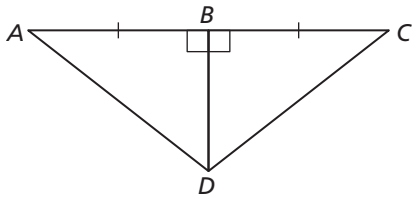
4.



5. Your friend claims that the SAS Congruence Theorem (Theorem 5.5) will apply to a triangle and its image after the triangle has been translated, reflected, rotated, and dilated. Is your friend correct? Explain your reasoning.

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

Prove: $\triangle ABD \cong \triangle CBD$

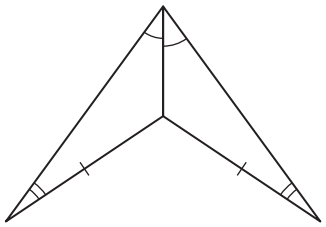


Name_____ Date _____

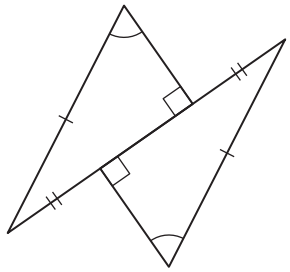
5.3 Practice B

In Exercises 1 and 2, decide whether enough information is given to prove that the triangles are congruent using the SAS Congruence Theorem (Theorem 5.5). Explain.

1.

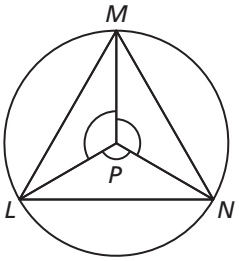


2.

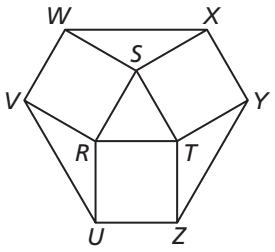


In Exercises 3 and 4, identify three congruent triangles and explain how to show that they are congruent.

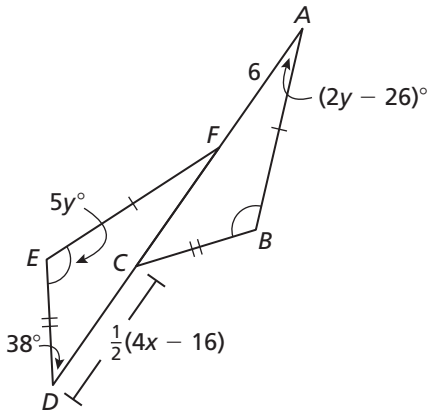
3. P is the center of the circle.



4. Three squares border equiangular and equilateral $\triangle RST$.

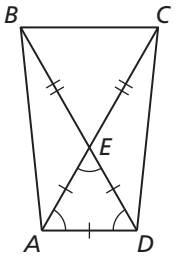


5. Use the information given in the figure to find the values of x and y.



6. **Given:** $\overline{EB} \cong \overline{EC}$, $\triangle AED$ is equilateral and equiangular.

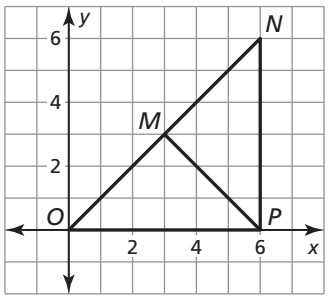
Prove: $\triangle ACD \cong \triangle DBA$



Name _____ Date _____

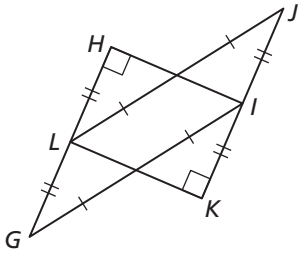
5.3 Enrichment and Extension

Proving Triangle Congruence by SAS



1. Describe how to show that $\triangle PMO \cong \triangle PMN$ using the SSS Congruence Postulate. Then, without using a protractor, find a way to show that the triangles are congruent using the SAS Congruence Postulate.

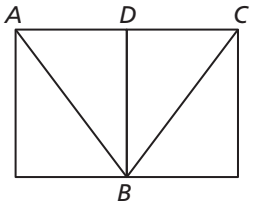
2. Determine whether enough information is given to prove that $\triangle GHI \cong \triangle JKL$. If there is enough information, state which congruence postulate or theorem you used.



In Exercises 3 and 4, use the diagram to write a two-column proof.

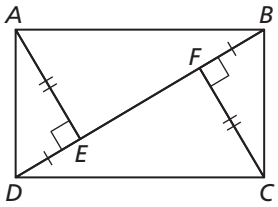
3. **Given:** $\overline{AC} \perp \overline{DB}$, D is the midpoint of $\overline{AC}$.

Prove: $\triangle ABD \cong \triangle CBD$

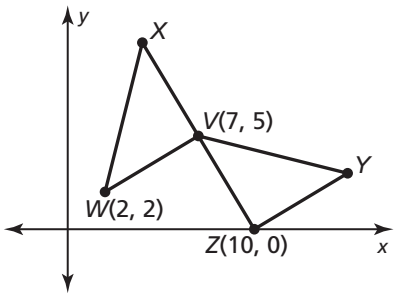


4. **Given:** $DE = BF$, $AE = CF$, $\overline{AE} \perp \overline{DB}$, $\overline{CF} \perp \overline{BD}$

Prove: $\triangle AEB \cong \triangle CFD$



5. In the figure, $\triangle WVX \cong \triangle YZV$. Find the coordinates of X and Y.



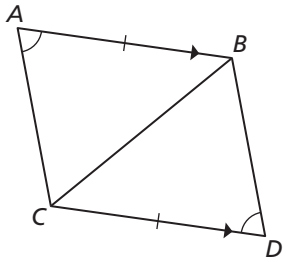
Name_____ Date _____

5.3 Puzzle Time

What Do You Call A Stubborn Angle?

Circle the letter of each correct answer in the boxes below. The circled letters will spell out the answer to the riddle.

In Exercises 1–6, use the diagram.



1. Identify the theorem.

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

Identify the parts that are congruent by the given reason in the proof.

STATEMENTS	REASONS
$\overline{AB} \cong \overline{DC}$	Given
$\overline{AB} \parallel \overline{DC}$	Given
2.	Alternate Interior Angles Theorem
3.	Reflexive Property of Congruence
4.	SAS Congruence Theorem

Name the included angle between the pair of sides given.

5. $\overline{AC}$ and $\overline{CB}$

6. $\overline{BC}$ and $\overline{CD}$

T	**O**	**H**	**B**	**T**	**M**
$\angle ABC$	$\angle BCD$	$\angle ABC \cong \angle CBD$	$\triangle ABC \cong \triangle DCB$	SAS Congruence	$\triangle ABC \cong \triangle BCD$
U	**A**	**R**	**M**	**S**	**E**
$\angle ACB$	$\angle BDC$	$\overline{AC} \cong \overline{BD}$	AAS Congruence	$\angle ABC \cong \angle DCB$	$\overline{BC} \cong \overline{CB}$