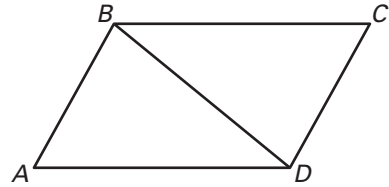**LESSON 4.9**

Exercise Set A

MM1G3c Understand and use congruence postulates and theorems for triangles (SSS, SAS, ASA, AAS, HL).
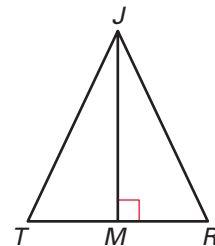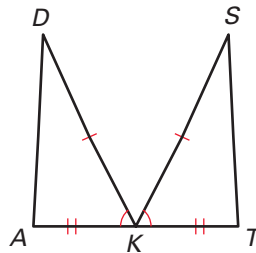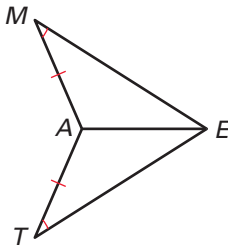
Use the diagram to name the included angle between the given pair of sides.

1. $\overline{AB}$ and $\overline{BC}$

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

3. $\overline{AB}$ and $\overline{BD}$

4. $\overline{BD}$ and $\overline{DA}$

5. $\overline{DA}$ and $\overline{AB}$

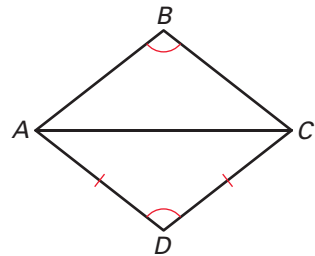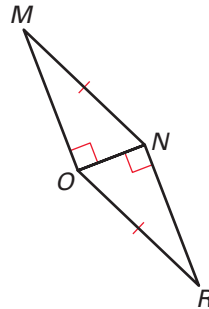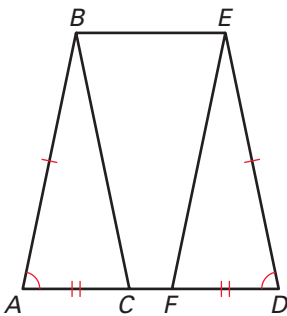**6.** $\overline{CD}$ and $\overline{DB}$

Decide whether enough information is given to prove that the triangles are congruent using the SAS Congruence Postulate.

7. $\triangle MAE$, $\triangle TAE$

8. $\triangle DKA$, $\triangle TKS$

9. $\triangle JRM$, $\triangle JTM$

Decide whether enough information is given to prove that the triangles are congruent. If there is enough information, state the congruence postulate or theorem you would use.

10. $\triangle ABC$, $\triangle DEF$

11. $\triangle MNO$, $\triangle RON$

12. $\triangle ABC$, $\triangle ADC$

13. Error Analysis *Describe* the error in stating that the two triangles are congruent.
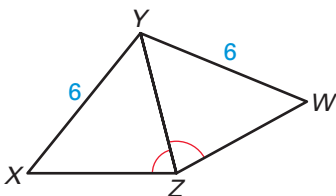
$\triangle XYZ \cong \triangle WYZ$ by the SAS Congruence Postulate. ✗

UNIT 4

Exercise Set A *(continued)*

State the third congruence that must be given to prove that $\triangle JRM \cong \triangle DFB$ using the indicated postulate.

14. GIVEN: $\overline{JR} \cong \overline{DF}$, $\overline{JM} \cong \overline{DB}$, __?__ $\cong$ __?__
Use the SSS Congruence Postulate.

15. GIVEN: $\overline{JR} \cong \overline{DF}$, $\overline{JM} \cong \overline{DB}$, __?__ $\cong$ __?__
Use the SAS Congruence Postulate.

16. GIVEN: $\overline{RM} \cong \overline{FB}$, $\angle J$ is a right angle and $\angle J \cong \angle D$, __?__ $\cong$ __?__
Use the HL Congruence Theorem.
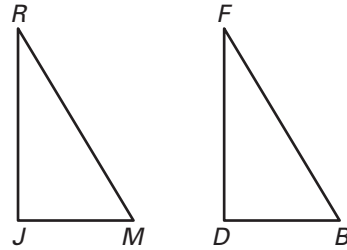
17. Proof Copy and complete the proof.

GIVEN: B is the midpoint of $\overline{AE}$.
B is the midpoint of $\overline{CD}$.

PROVE: $\triangle ABD \cong \triangle EBC$
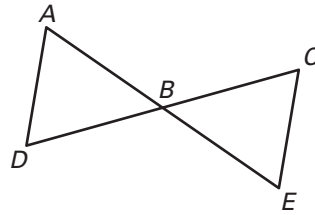
Statements	Reasons
1. B is the midpoint of $\overline{AE}$.	**1.** __?__
2. __?__	**2.** Definition of midpoint
3. B is the midpoint of $\overline{CD}$.	**3.** __?__
4. __?__	**4.** Definition of midpoint
5. $\angle ABD \cong \angle EBC$	**5.** __?__
6. $\triangle ABD \cong \triangle EBC$	**6.** __?__

18. Proof Copy and complete the proof.

GIVEN: $\overline{AB} \perp \overline{AD}$, $\overline{AD} \perp \overline{CD}$, $\overline{AB} \cong \overline{CD}$

PROVE: $\triangle ABD \cong \triangle DCA$
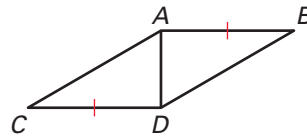
Statements	Reasons
1. $\overline{AB} \perp \overline{AD}$ and $\overline{AD} \perp \overline{CD}$	**1.** __?__
2. $\angle BAD$ and $\angle CDA$ are right angles.	**2.** __?__
3. $\angle BAD \cong \angle CDA$	**3.** __?__
4. $\overline{AB} \cong \overline{CD}$	**4.** __?__
5. $\overline{AD} \cong \overline{AD}$	**5.** __?__
6. $\triangle ABD \cong \triangle DCA$	**6.** __?__

LESSON 4.9

Exercise Set B

MM1G3c Understand and use congruence postulates and theorems for triangles (SSS, SAS, ASA, AAS, HL).
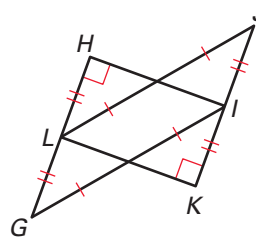
Decide whether enough information is given to prove that the triangles are congruent. If there is enough information, state the congruence postulate or theorem you would use.
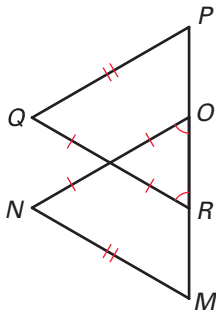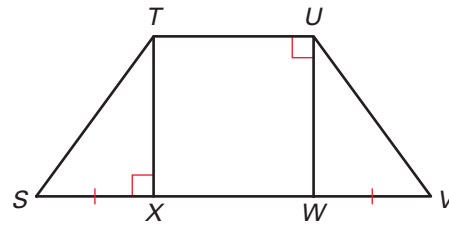
1. $\triangle ABC, \triangle FEC$
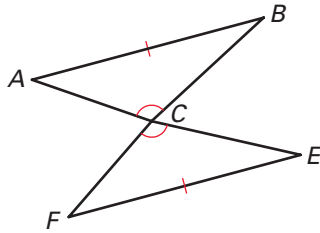
2. $\triangle GHI, \triangle JKL$

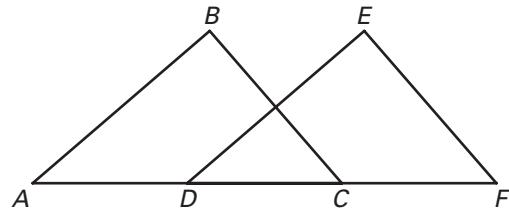**3.** $\triangle MNO, \triangle PQR$

4. $\triangle STX, \triangle VUW$

State the third congruence that must be given to prove that $\triangle ABC \cong \triangle FED$ using the indicated postulate or theorem.

5. **GIVEN:** $\overline{BC} \cong \overline{ED}, \overline{AC} \cong \overline{FD}, \underline{\ ?\ } \cong \underline{\ ?\ }$
Use the SAS Congruence Postulate.

6. **GIVEN:** $\overline{AB} \cong \overline{FE}, \overline{AC} \cong \overline{FD}, \underline{\ ?\ } \cong \underline{\ ?\ }$
Use the SSS Congruence Postulate.

7. **GIVEN:** $\overline{BC} \cong \overline{ED}, \angle B$ is a right angle and $\angle B \cong \angle E, \underline{\ ?\ } \cong \underline{\ ?\ }$
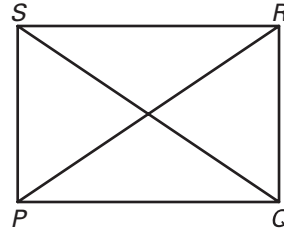Use the HL Congruence Theorem.

8. Suppose P is the midpoint of $\overline{OQ}$ in $\triangle OQS$. If $\overline{SP} \perp \overline{OQ}$, explain why $\triangle SPO \cong \triangle SPQ$.

Exercise Set B *(continued)*

9. Proof Copy and complete the proof.

GIVEN: $\overline{QS} \cong \overline{PR}$, $\overline{PS} \perp \overline{RS}$, $\overline{QR} \perp \overline{RS}$

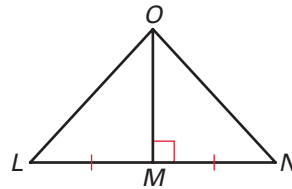**PROVE:** $\triangle PRS \cong \triangle QSR$

Statements	Reasons
1. $\overline{QS} \cong \overline{PR}$	1. Given
2. $\overline{PS} \perp \overline{RS}$, $\overline{QR} \perp \overline{RS}$	2. Given
3. $\angle S$ and $\angle R$ are right angles.	3. __?__
4. __?__	4. Definition of a right triangle
5. $\overline{RS} \cong \overline{SR}$	5. __?__
6. $\triangle PRS \cong \triangle QSR$	6. __?__

10. Proof Copy and complete the proof.

GIVEN: $\overline{OM} \perp \overline{LN}$, $\overline{ML} \cong \overline{MN}$

PROVE: $\triangle OML \cong \triangle OMN$

Statements	Reasons
1. $\overline{OM} \perp \overline{LN}$	1. Given
2. __?__	2. If 2 angles are $\perp$, then they form 4 right $\angle$s.
3. __?__	3. Right Angle Congruence Theorem
4. $\overline{ML} \cong \overline{MN}$	4. __?__
5. $\overline{OM} \cong \overline{OM}$	5. __?__
6. $\triangle OML \cong \triangle OMN$	6. __?__

11. Which two triangles in the figure are congruent? *Explain* your reasoning.