

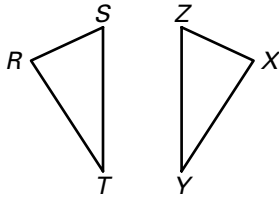
LESSON
4.6

Practice A

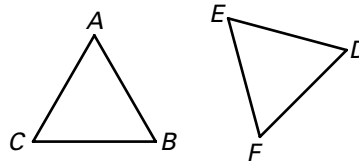
For use with pages 268–275

List all of the pairs of angles and sides that are congruent based on the given congruence statement and the figure.

1. $\triangle RST \cong \triangle XZY$

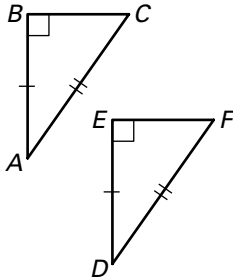


2. $\triangle ABC \cong \triangle DEF$

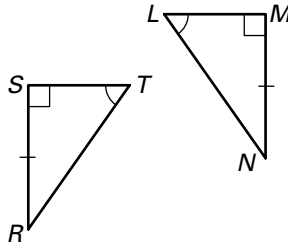


Tell which triangles you can show are congruent in order to prove the statement. What postulate or theorem would you use?

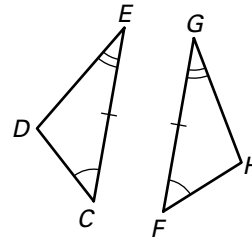
3. $\angle C \cong \angle F$



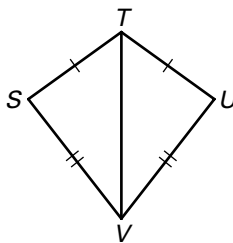
4. $\overline{RT} \cong \overline{LN}$



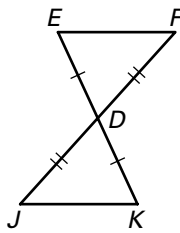
5. $\angle D \cong \angle H$



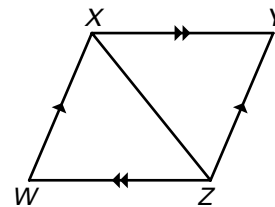
6. $\angle STV \cong \angle UTV$



7. $\overline{EF} \cong \overline{KJ}$

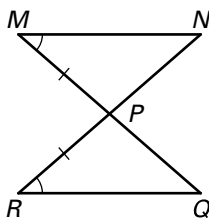


8. $\overline{XY} \cong \overline{ZW}$

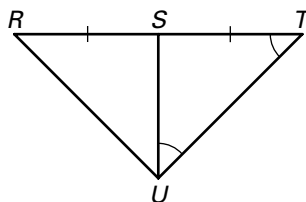


Is enough information given in the figure to show that the given statement is true? Explain.

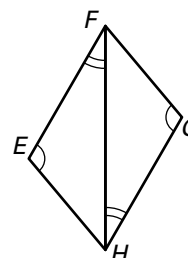
9. $\angle N \cong \angle Q$



10. $\overline{RU} \cong \overline{TU}$



11. $\overline{FG} \cong \overline{HE}$

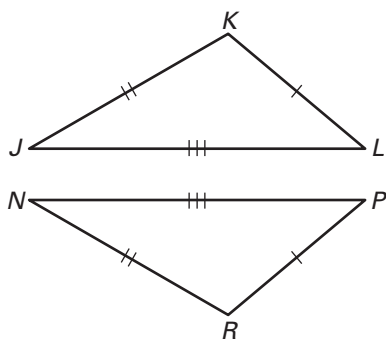


LESSON
4.6

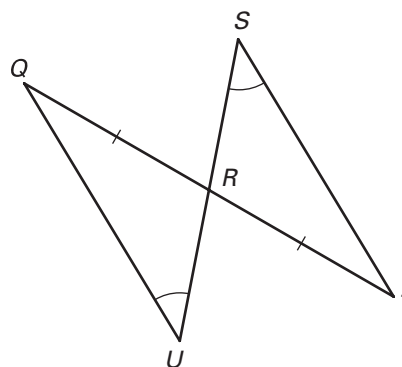
Practice A *continued*
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Use the diagram to write a plan for a proof.

12. PROVE: $\angle J \cong \angle N$

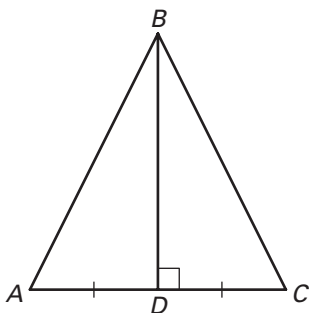


13. PROVE: $\overline{ST} \cong \overline{UQ}$

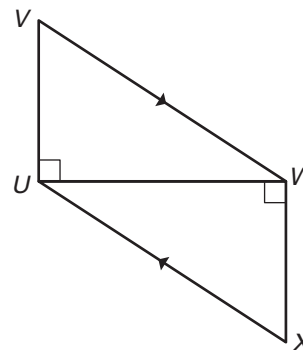


Use the information given in the diagram to write a proof.

14. PROVE: $\angle ABD \cong \angle CBD$



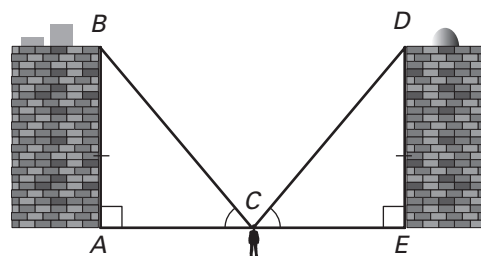
15. PROVE: $\overline{UV} \cong \overline{WX}$



16. **Using angles** You can position yourself halfway between two buildings of equal height by moving to a position where congruent angles are formed between the horizontal and your line of sight to the top of each building. Justify this by completing the three step proof below.

GIVEN: $\overline{AB} \cong \overline{ED}$, $\angle ACB \cong \angle ECD$,
 $\angle A$ and $\angle E$ are right angles.

PROVE: $\overline{AC} \cong \overline{EC}$



Statements

Reasons

1. $\overline{AB} \cong \overline{ED}$, $\angle ACB \cong \angle ECD$,
 $\angle A$ and $\angle E$ are right angles.

1. ?

2. $\triangle ABC \cong \triangle EDC$

2. ?

3. $\overline{AC} \cong \overline{EC}$

3. ?

Lesson 4.5, continued

5.

Statements	Reasons
1. $\overline{AE} \parallel \overline{BF}, \overline{CE} \parallel \overline{DF}$	1. Given
2. $\angle EAF \cong \angle FBD$	2. Corresponding Angles Postulate
3. $\overline{AB} \cong \overline{CD}$	3. Given
4. $AB = CD$	4. Definition of congruent segments
5. $AC = AB + BC$ $BD = BC + CD$	5. Segment Addition Postulate
6. $AC = CD + BC$	6. Substitution property of equality
7. $AC = BD$	7. Substitution property of equality
8. $\overline{AC} \cong \overline{BD}$	8. Definition of congruent segments
9. $\angle FDB \cong \angle ECA$	9. Corresponding Angles Postulate
10. $\triangle AEC \cong \triangle BFD$	10. ASA Congruence Postulate

6.

Statements	Reasons
1. $\angle KNL \cong \angle MNL,$ $\angle KLN \cong \angle MLN$	1. Given
2. $\overline{NL} \cong \overline{NL}$	2. Reflexive property of congruence
3. $\triangle KNL \cong \triangle MNL$	3. ASA Congruence Postulate
4. $\overline{NK} \cong \overline{NM}$	4. Corresponding parts of congruent triangles are congruent
5. $m\angle JNK + m\angle KNL = 180^\circ,$ $m\angle JNM + m\angle MNL = 180^\circ$	5. Linear Pair Postulate
6. $m\angle JNK + m\angle KNL = m\angle JNM + m\angle MNL$	6. Transitive property of equality
7. $m\angle KNL = m\angle MNL$	7. Definition of congruent angles
8. $m\angle JNK + m\angle KNL = m\angle JNM + m\angle KNL$	8. Substitution property of equality
9. $m\angle JNK = m\angle JNM$	9. Subtraction property of equality

Statements	Reasons
10. $\angle JNK \cong \angle JNM$	10. Definition of congruent angles
11. $\overline{JN} \cong \overline{JN}$	11. Reflexive property of congruence
12. $\triangle JNK \cong \triangle JNM$	12. SAS Congruence Postulate

Lesson 4.6

Practice Level A

1. $\angle R \cong \angle X, \angle S \cong \angle Z, \angle T \cong \angle Y,$
 $\overline{RS} \cong \overline{XZ}, \overline{ST} \cong \overline{ZY}, \overline{RT} \cong \overline{XY}$ 2. $\angle A \cong \angle D,$
 $\angle B \cong \angle E, \angle C \cong \angle F, \overline{AB} \cong \overline{DE}, \overline{BC} \cong \overline{EF},$
 $\overline{AC} \cong \overline{DF}$ 3. $\triangle ABC \cong \triangle DEF$; HL

4. $\triangle RST \cong \triangle NML$; AAS 5. $\triangle CDE \cong \triangle FHG$;
ASA 6. $\triangle STV \cong \triangle UTV$; SSS 7. $\triangle DEF \cong$
 $\triangle DKJ$; SAS 8. $XYZ \cong \triangle ZWX$; ASA

9. Yes; $\triangle MNP \cong \triangle RQP$ by ASA, so $\angle N$ and
 $\angle Q$ are corresponding parts of $\cong \triangle$.

10. No; Only 2 pairs of sides can be assumed to
be \cong in $\triangle RSU$ and $\triangle TSU$, so there is not enough
information to use congruent triangles.

11. Yes; $\triangle EFH \cong \triangle GHF$ by AAS, so \overline{FG} and \overline{HE}
are corresponding parts of $\cong \triangle$. 12. Use SSS to
prove $\triangle JKL \cong \triangle NRP$, then use the fact that $\angle J$
and $\angle N$ are corresponding parts of $\cong \triangle$.

13. Show because vertical angles,
 $\angle SRT \cong \angle URQ$. Use AAS to show
 $\triangle RST \cong \triangle RUQ$, then use the fact that \overline{ST}
and \overline{UQ} are corresponding parts of $\cong \triangle$

14.

Statements	Reasons
1. $\overline{AD} \cong \overline{CD}, \overline{BD} \perp \overline{AC}$	1. Given
2. $\angle ADB$ and $\angle CDB$ are right angles.	2. Thm 3.9
3. $\angle ADB \cong \angle CDB$	3. All right angles are \cong .
4. $\overline{BD} \cong \overline{BD}$	4. Reflexive Prop. of Congruence
5. $\triangle ADB \cong \triangle CBD$	5. SAS Congruence Post.
6. $\angle ABD \cong \angle CBD$	6. Corr. parts of $\cong \triangle$ are \cong .

Lesson 4.6, continued

15.

Statements	Reasons
1. $\overline{VW} \parallel \overline{XU}$, $\angle VUW$ and $\angle XWU$ are right angles.	1. Given
2. $\overline{UW} \cong \overline{WU}$	2. Reflexive Prop. of Congruence
3. $\angle VUW \cong \angle XWU$	3. All right \sphericalangle s are \cong .
4. $\angle VWU \cong \angle XUW$	4. Alt. Interior Angles Thm.
5. $\triangle UVW \cong \triangle WXU$	5. ASA Congruence Post.
6. $\overline{UV} \cong \overline{WX}$	6. Corr. parts of $\cong \triangle$ s are \cong .

16. Given; AAS Congruence Theorem; Corresponding parts of $\cong \triangle$ s are \cong .

Practice Level B

1. $\triangle ABC \cong \triangle CDA$; SAS
2. $\triangle TSU \cong \triangle VSU$; AAS
3. $\triangle ABD \cong \triangle CDB$; SSS
4. $\triangle NKH \cong \triangle TMG$; AAS
5. $\triangle ABD \cong \triangle CBE$; ASA
6. $\triangle ABC \cong \triangle STA$; AAS

7. Use the HL Congruence Theorem to prove that $\triangle DAB \cong \triangle BCD$. Then use the fact that corresponding parts of congruent triangles are congruent to prove that $\angle DAB \cong \angle BCD$.

8. Because $\overline{ST} \parallel \overline{RQ}$, $\angle PRQ \cong \angle RST$ by the Corresponding Angles Postulate. Use the ASA Congruence Postulate to prove that $\triangle PRQ \cong \triangle RST$. Then use the fact that corresponding parts of congruent triangles are congruent to prove that $\overline{ST} \cong \overline{RQ}$.

9. Use the Distance Formula to find the side lengths of the triangles. Use the SSS Congruence Postulate to show that $\triangle ABC \cong \triangle DEF$. Then use the fact that corresponding parts of congruent triangles are congruent to prove that $\angle A \cong \angle D$.

10. Use the Distance Formula to find the side lengths of the triangles. Use the SSS Congruence Postulate to show that $\triangle ABC \cong \triangle DEF$. Then use the fact that corresponding parts of congruent triangles are congruent to prove that $\angle A \cong \angle D$.

11. Given; Given; Definition of angle bisector; Reflexive Property of Congruence; SAS Congruence Postulate; Corresponding parts of congruent triangles are congruent.

12.

Statements	Reasons
1. $\overline{MQ} \cong \overline{NT}$	1. Given
2. $\overline{MQ} \parallel \overline{NT}$	2. Given
3. $\angle NTM \cong \angle QMT$	3. Alternate Interior Angles Theorem
4. $\overline{MT} \cong \overline{MT}$	4. Reflexive Property of Congruence
5. $\triangle NTM \cong \triangle QMT$	5. SAS Congruence Postulate
6. $\overline{MN} \cong \overline{TQ}$	6. Corresponding parts of congruent triangles are congruent.

13.

Statements	Reasons
1. $\overline{AB} \cong \overline{BE}$	1. Given
2. $\angle ADB \cong \angle ECB$	2. Given
3. $\angle ABD \cong \angle EBC$	3. Vertical Angles Theorem
4. $\triangle ABD \cong \triangle EBC$	4. AAS Congruence Theorem
5. $\overline{DB} \cong \overline{CB}$	5. Corresponding parts of congruent triangles are congruent.

14. Given; Definition of corresponding angles; Corresponding Angles Converse

Practice Level C

1. $\triangle HGL \cong \triangle JKM$; AAS 2. $\triangle PQU \cong \triangle VPS$; AAS 3. $\triangle ABC \cong \triangle DEF$; ASA 4. Use the \cong angles in the linear pairs to show $\angle RZS \cong \angle UYT$. Show $\triangle RSZ \cong \triangle UTY$ by AAS, so $\overline{RZ} \cong \overline{YU}$ because they are corresponding parts.

5. Show $\angle FHG \cong \angle JHI$ because they are vertical. Show $\triangle FGH \cong \triangle JIH$ by AAS, so $\overline{FH} \cong \overline{JH}$ because they are corresponding parts.

6. Show $\angle ADE$ is a right \sphericalangle . Use SAS to show $\triangle ADE \cong \triangle CDE$, so by corresponding parts, $\angle AED \cong \angle CED$ and $\overline{AE} \cong \overline{CE}$. Use SAS to show $\triangle ABE \cong \triangle CBE$. So by corresponding parts, $\angle 1 \cong \angle 2$. 7. Show $\triangle HKL \cong \triangle HML$ by ASA, so by corresponding parts, $\angle HKL \cong \angle HML$ and $\overline{HK} \cong \overline{HM}$. Use the congruent angles in the linear pairs to show $\angle HMN \cong \angle HKJ$. By vertical angles, $\angle JHK \cong \angle NHM$. Show $\triangle HJK \cong \triangle HNM$ by ASA, so by corresponding parts, $\angle 1 \cong \angle 2$.

8. Use AAS to show $\triangle ABD \cong \triangle GFD$. Then by corresponding parts $\overline{BD} \cong \overline{FD}$. By vertical angles, $\angle ADB \cong \angle EDF$ and $\angle CDB \cong \angle GDF$. Show