

5.7 Start Thinking

Find any small triangular-shaped object. Use a ruler and a protractor to measure its side lengths and angle measures.

Use the measurements to construct a congruent triangle. Label the triangle to show its measurements.

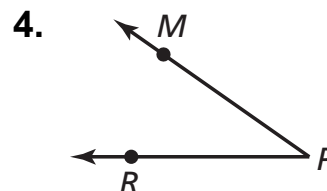
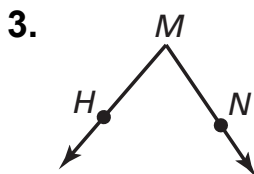
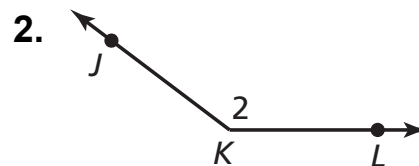
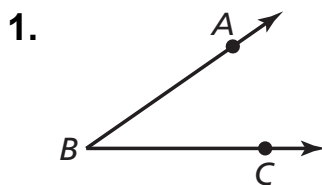
5.7 Warm Up

Name the property the statement illustrates.

1. If $\overline{RU} \cong \overline{WX}$ and $\overline{WX} \cong \overline{YZ}$, then $\overline{RU} \cong \overline{YZ}$.
2. $\angle A \cong \angle A$
3. If $\angle B \cong \angle C$, then $\angle C \cong \angle B$.
4. $\overline{JK} \cong \overline{JK}$
5. If $\overline{LM} \cong \overline{NP}$, then $\overline{NP} \cong \overline{LM}$.
6. If $\angle Q \cong \angle R$ and $\angle R \cong \angle S$, then $\angle Q \cong \angle S$.

5.7 Cumulative Review Warm Up

Write three names for the angles.

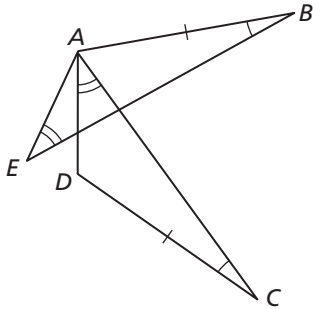


5.7

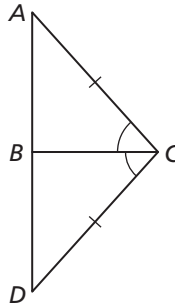
Practice A

In Exercises 1 and 2, explain how to prove that the statement is true.

1. $\overline{EB} \cong \overline{AC}$

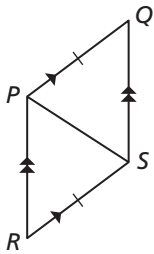


2. $\angle A \cong \angle D$

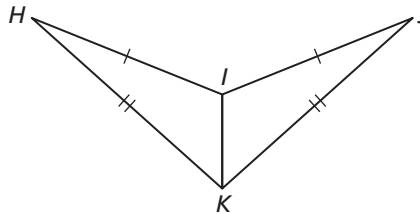


In Exercises 3 and 4, write a plan to prove the given statement.

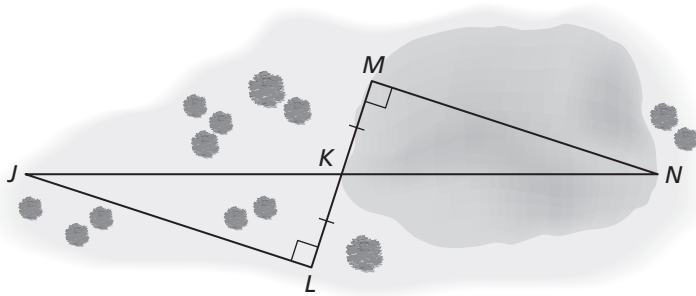
3. $\overline{PR} \cong \overline{SQ}$



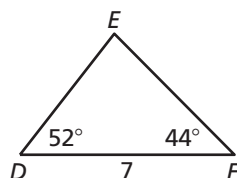
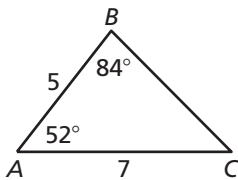
4. $\angle H \cong \angle J$



5. Use the figure to explain how to find the distance across the pond indirectly. Then prove that your method works.



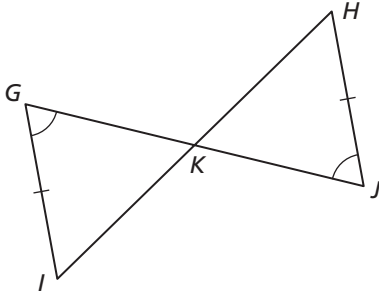
6. Find DE , if possible. Explain your reasoning.



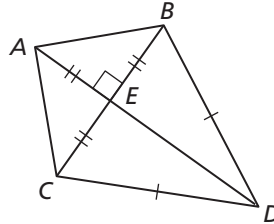
5.7 Practice B

In Exercises 1 and 2, explain how to prove that the statement is true.

1. $\overline{GK} \cong \overline{JK}$

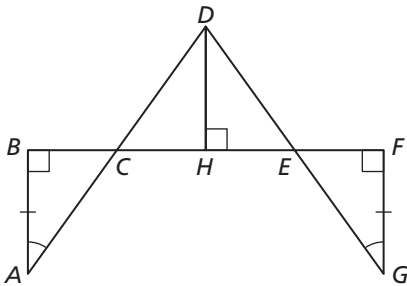


2. $\overline{BA} \cong \overline{CA}$

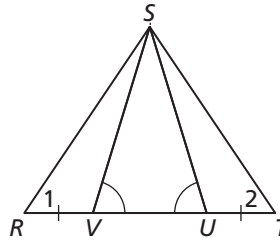


In Exercises 3 and 4, write a plan to prove the given statement.

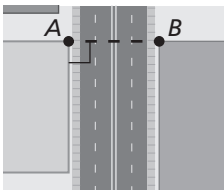
3. $\overline{DC} \cong \overline{DE}$



4. $\angle 1 \cong \angle 2$



5. You want to know how far it is from point A of the roof you are on to point B of the roof of the building across the street. The buildings are the same height.



- Explain how to use triangles to find AB . Draw a diagram showing the additional points you will use.
- Explain how you know your method helps you to find AB .

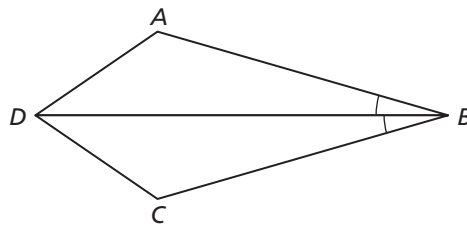
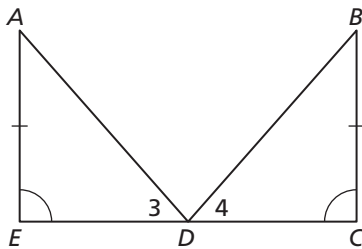
5.7 Enrichment and Extension

Using Congruent Triangles

In Exercises 1 and 2, for what value(s) of x will the triangles be congruent?

1. $m\angle 3 = x^2$; $m\angle 4 = 7x - 10$

2. $AB = 3x + 4$; $CB = 2 + 2x + 2\sqrt{2x + 1}$



3. Given that $\triangle ABC \cong \triangle DEF$, $m\angle A = 70^\circ$, $m\angle B = 60^\circ$, $m\angle C = 50^\circ$, $m\angle D = (3x + 10)^\circ$,

$m\angle E = \left(\frac{y}{3} + 20\right)^\circ$, and $m\angle F = (z^2 + 14)^\circ$, find the values of x , y , and z .

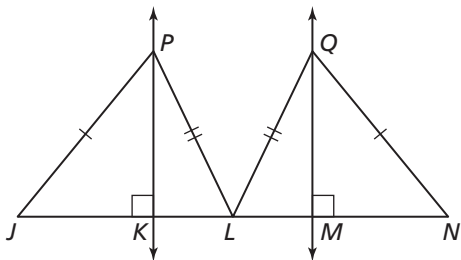
4. Use the following vertices of $\triangle ABC$ and $\triangle DEF$ to show that $\angle A \cong \angle D$. Explain your reasoning.

$A(3, 7)$, $B(6, 11)$, $C(11, 13)$, $D(2, -4)$, $E(5, -8)$, $F(10, -10)$

In Exercises 5 and 6, refer to the diagram to write a two-column proof.

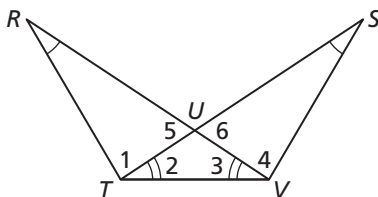
5. **Given:** L is the midpoint of \overline{JN} , $\overline{PJ} \cong \overline{QN}$, $\overline{PL} \cong \overline{QL}$, $\angle PKJ$ and $\angle QMN$ are right angles.

Prove: $\angle MQN \cong \angle KPJ$



6. **Given:** $\angle R \cong \angle S$, $\angle 2 \cong \angle 3$

Prove: $\overline{SU} \cong \overline{RU}$





Puzzle Time

Why Do Pigs Have Pink Skin?

A	B	C	D	E
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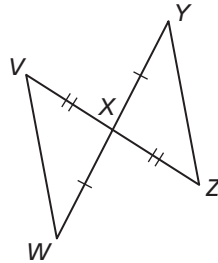
Complete each exercise. Find the answer in the answer column. Write the word under the answer in the box containing the exercise letter.

similar WOLF
vertical angles THEIR
angular sight SUN
SAS INSIDES
ASA BECAUSE

Complete the statement.

- A. Congruent triangles have congruent _____ parts.
- B. When you cannot measure something directly, you can use calculations to discover the length _____.

Complete the missing reasons in the proof.



STATEMENTS	REASONS
$\overline{VX} \cong \overline{ZX}$	Given
$\overline{WX} \cong \overline{YX}$	Given
$\angle VXW \cong \angle YXZ$	C.
$\triangle VXW \cong \triangle ZYX$	D.
$\angle V \cong \angle Z$	E.

corresponding parts IN
adjacent angles HOME
indirectly KEEP
adjacent parts AND
corresponding TO