

# 4.6

## Use Congruent Triangles

### Goal

- Use congruent triangles to prove corresponding parts congruent.

\*By definition, congruent triangles have congruent corresponding parts. So, if you can prove that two triangles are congruent, you know that their corresponding parts must be congruent as well!

### CPCTC

"Corresponding Parts of Congruent Triangles are Congruent"

\*Your book does not talk about this very much, but we will use CPCTC as a reason in some of our proofs!

## Using CPCTC:

1. Prove the triangles are congruent.
  - a. Use SSS, SAS, ASA, AAS, HL ...
2. Prove the sides or angles are congruent using CPCTC.

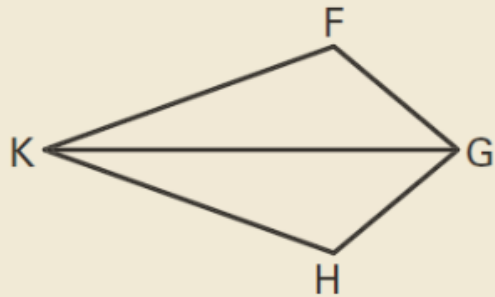
\*Remember: if we know the triangles are congruent, we know that all the corresponding parts are congruent.

\*\*\*3 angles, 3 sides ..... remember earlier in the chapter we had to write all six things down!!

Use the given information to prove the parts of the kite are congruent.

Given:  $\overline{GK}$  bisects  $\angle FGH$  and  $\angle FKH$ .

Prove:  $\overline{FK} \cong \overline{HK}$



Statements

Reasons

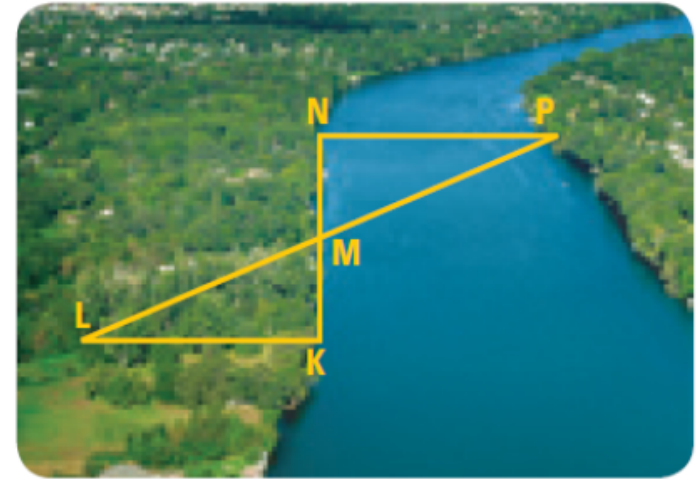
## EXAMPLE 2 Use congruent triangles for measurement

### INDIRECT MEASUREMENT

When you cannot easily measure a length directly, you can make conclusions about the length *indirectly*, usually by calculations based on known lengths.

**SURVEYING** Use the following method to find the distance across a river, from point  $N$  to point  $P$ .

- Place a stake at  $K$  on the near side so that  $\overline{NK} \perp \overline{NP}$ .
- Find  $M$ , the midpoint of  $\overline{NK}$ .
- Locate the point  $L$  so that  $\overline{NK} \perp \overline{KL}$  and  $L$ ,  $P$ , and  $M$  are collinear.
- Explain how this plan allows you to find the distance.



N

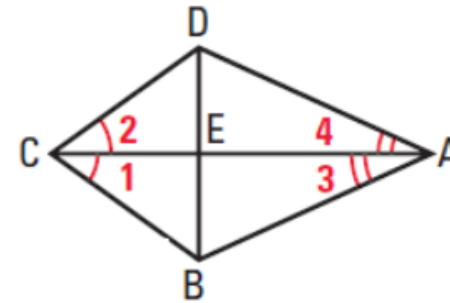
P

### EXAMPLE 3 Plan a proof involving pairs of triangles

Use the given information to write a plan for proof.

**GIVEN** ▶  $\angle 1 \cong \angle 2$ ,  $\angle 3 \cong \angle 4$

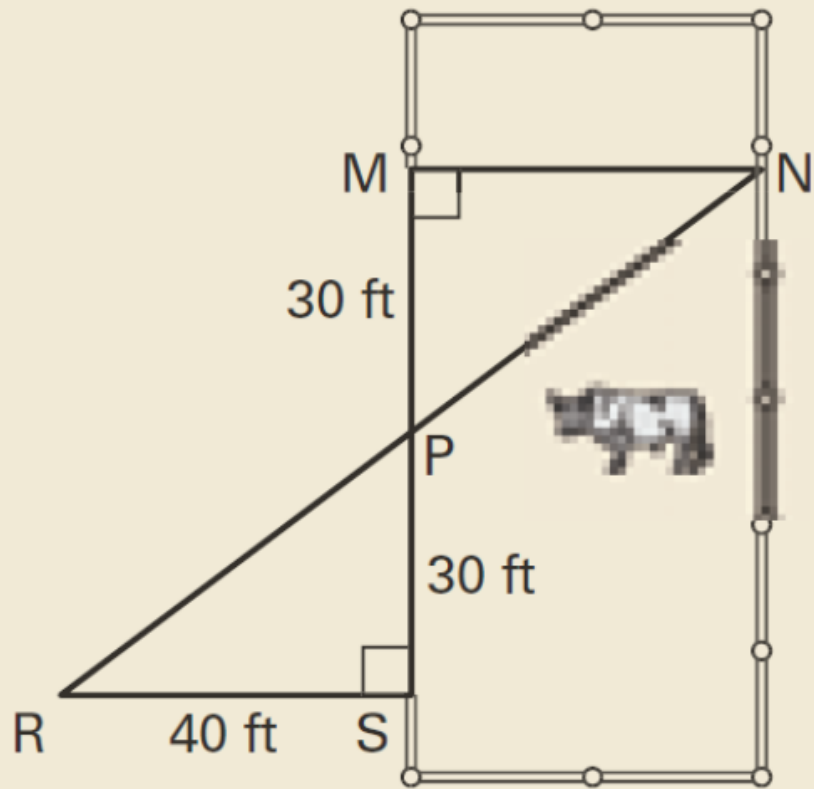
**PROVE** ▶  $\triangle BCE \cong \triangle DCE$



Statements

Reasons

If  $P$  is the midpoint of  $MS$ , how wide is the bull's pasture?



Day 1

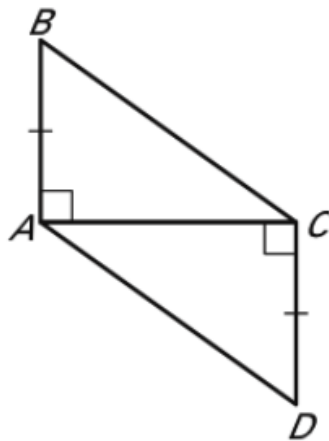
Assignment:

4.6 ws

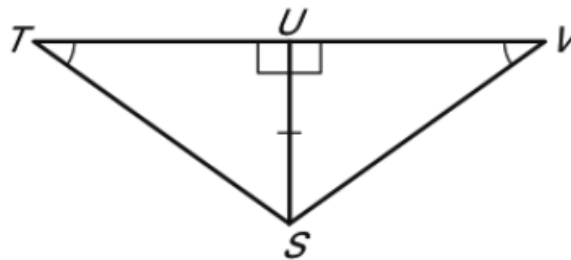
**LESSON**  
**4.6**
**Practice B**
*For use with pages 256–263*

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

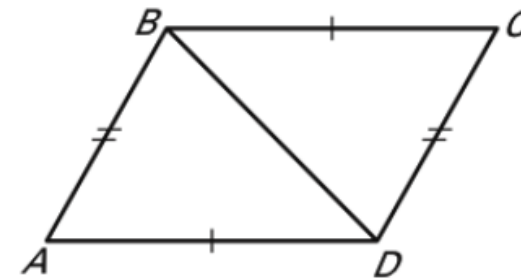
1.  $\overline{BC} \cong \overline{AD}$



2.  $\triangle TSU \cong \triangle VSU$

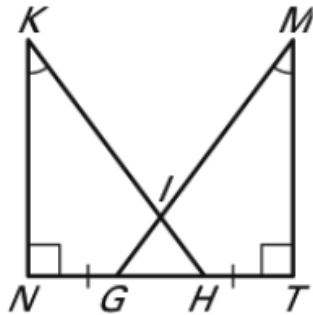


3.  $\triangle ADB \cong \triangle CBD$

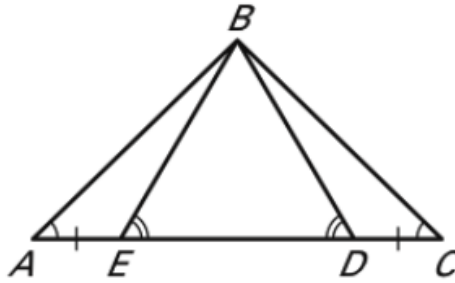




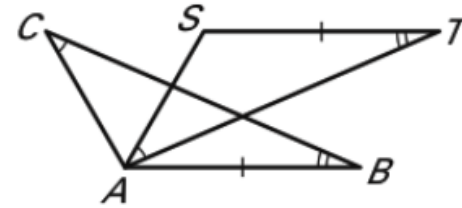
4.  $\triangle KHN \cong \triangle MGT$



5.  $\overline{BD} \cong \overline{BE}$

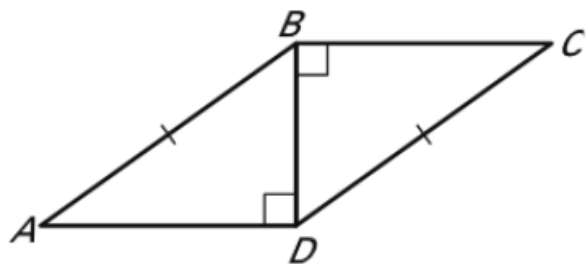


6.  $\overline{BC} \cong \overline{AT}$

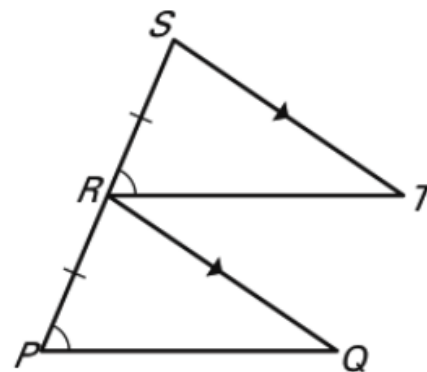


Use the diagram to write a plan for a proof.

7. PROVE:  $\triangle DAB \cong \triangle BCD$



8. PROVE:  $\overline{ST} \cong \overline{RQ}$



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

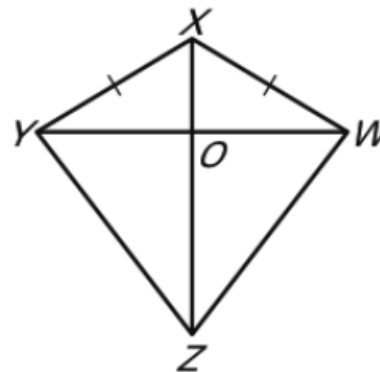
**9.**  $A(1, 2), B(4, -3), C(2, 5), D(4, 7), E(7, 2), F(5, 10)$

**10.**  $A(2, 3), B(2, 9), C(6, 6), D(8, 5), E(8, 11), F(12, 8)$

**11. Proof** Complete the proof.

**GIVEN:**  $\overline{YX} \cong \overline{WX}$   
 $\overline{ZX}$  bisects  $\angle YXW$ .

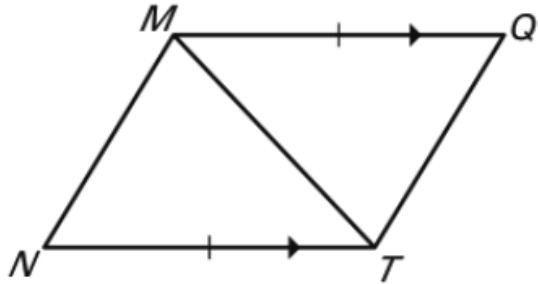
**PROVE:**  $\overline{YZ} \cong \overline{WZ}$



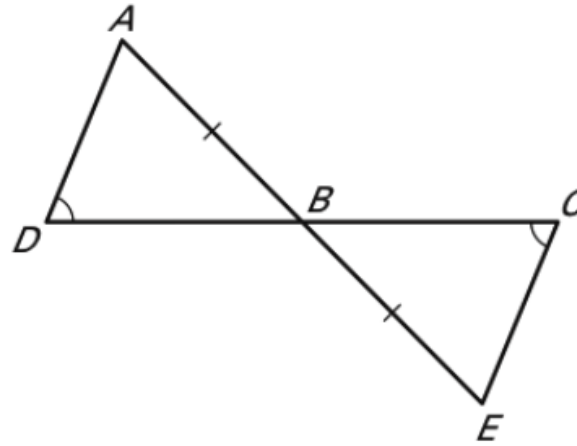
Statements	Reasons
1. $\overline{YX} \cong \overline{WX}$	1. <u>?</u>
2. $\overline{ZX}$ bisects $\angle YXW$ .	2. <u>?</u>
3. $\angle YXZ \cong \angle WXZ$	3. <u>?</u>
4. $\overline{XZ} \cong \overline{XZ}$	4. <u>?</u>
5. $\triangle YXZ \cong \triangle WXZ$	5. <u>?</u>
6. $\overline{YZ} \cong \overline{WZ}$	6. <u>?</u>

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

12. PROVE:  $\overline{MN} \cong \overline{TQ}$



13. PROVE:  $\overline{DB} \cong \overline{CB}$



## Day 2 Assignment:

p. 259 (3-8, 10, 11, 15-24 mult of  
3, 28, 30, 33-35, 41-46)