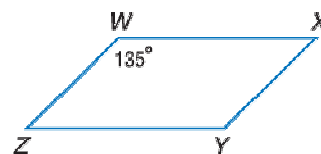


## Lesson 5-6

## Example 1

In parallelogram  $WXYZ$ ,  $m\angle W = 135$ .  
Find  $m\angle X$ ,  $m\angle Y$ , and  $m\angle Z$ .



## Solution

$\angle W$  and  $\angle Z$  are consecutive angles, so they are supplementary.

$$\begin{aligned} m\angle W + m\angle Z &= 180^\circ \\ 135^\circ + m\angle Z &= 180^\circ \\ m\angle Z &= 180^\circ - 135^\circ = 45^\circ \end{aligned}$$

$\angle W$  and  $\angle Y$  are opposite angles, so they are congruent.

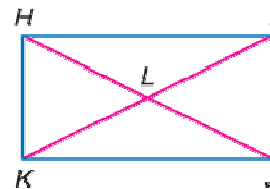
$$\angle W \cong \angle Y, \text{ so } m\angle Y = 135^\circ.$$

$\angle Z$  and  $\angle X$  are opposite angles, so they are also congruent.

$$\angle Z \cong \angle X, \text{ so } m\angle X = 45^\circ.$$

## Example 2

Figure  $HJK$  is a rectangle. Name all the pairs of congruent segments.



## Solution

Since  $HJK$  is a rectangle, it is also a parallelogram.

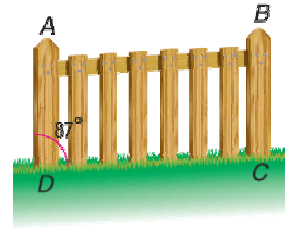
By *Property 1*,  $\overline{HI} \cong \overline{JK}$  and  $\overline{HK} \cong \overline{IJ}$ .

By *Property 6*,  $\overline{HJ} \cong \overline{IK}$ .

Also, since the figure is a parallelogram, by *Property 5*,  $\overline{HL} \cong \overline{LJ}$  and  $\overline{IL} \cong \overline{LK}$ .

**Example 3**

**CONSTRUCTION** A section of fence is being installed on the slope of a hill as shown. The two fence posts will be parallel to each other, that is  $\overline{AD} \parallel \overline{BC}$ . The top of the fence,  $\overline{AB}$  is parallel to the ground. If the first fence post forms an angle of  $87^\circ$  with the ground, what is the measure of  $\angle BCD$ ?

**Solution**

Since  $\overline{AD} \parallel \overline{BC}$  and  $\overline{AB} \parallel \overline{DC}$ ,  $ABCD$  is a parallelogram. So, by *Property 3*, the consecutive angles  $\angle ADC$  and  $\angle BCD$  are supplementary.

$$\begin{aligned} m\angle ADC + m\angle BCD &= 180^\circ \\ 87^\circ + m\angle BCD &= 180^\circ \\ m\angle BCD &= 180^\circ - 87^\circ = 93^\circ \end{aligned}$$