

# Congruence and Triangles

**Essential question:** *What can you conclude about two triangles that are congruent?*

When you know that two triangles are congruent, you can make conclusions about the sides and angles of the triangles.

COMMON CORE

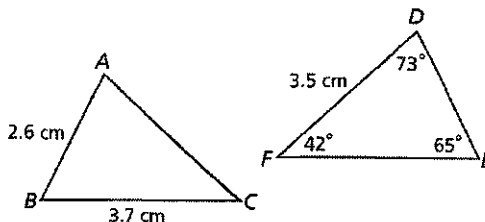
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## 1 EXAMPLE Finding an Unknown Dimension

$\triangle ABC \cong \triangle DEF$ . Find  $DE$  and  $m\angle B$ . Explain your reasoning.

- A** Complete the following to find  $DE$ .

Because  $\triangle ABC \cong \triangle DEF$ , there is a sequence of rigid motions that maps  $\triangle ABC$  to  $\triangle DEF$ .



This same sequence of rigid motions maps  $\overline{AB}$  to \_\_\_\_\_.

This means  $\overline{AB} \cong$  \_\_\_\_\_.

Congruent segments have the same length, so  $AB =$  \_\_\_\_\_.

$AB =$  \_\_\_\_\_, so  $DE =$  \_\_\_\_\_.

- B** To find  $m\angle B$ , use similar reasoning to show that  $\angle B \cong$  \_\_\_\_\_.

So,  $m\angle B =$  \_\_\_\_\_.

### REFLECT

- 1a.** If you know  $\triangle ABC \cong \triangle DEF$ , what six congruence statements about segments and angles can you write? Why?

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When two triangles are congruent, the **corresponding parts** are the sides and angles that are images of each other. You write a congruence statement for two figures by matching the corresponding parts. In other words, the statement  $\triangle ABC \cong \triangle DEF$  contains the information that  $\overline{AB}$  corresponds to  $\overline{DE}$  (and  $\overline{AB} \cong \overline{DE}$ ),  $\angle A$  corresponds to  $\angle D$  (and  $\angle A \cong \angle D$ ), and so on.