

LESSON

9

# Congruent Polygons

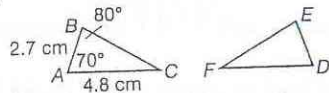
## Review It!

When you work with congruent polygons, remember these words:

**polygon** a closed figure with 3 or more sides  
**corresponding angles of polygons** angles that are in the same position in each polygon

**congruent** having exactly the same shape and size

Triangle  $ABC$  is congruent to triangle  $DEF$ . Find the measure of  $\angle D$  and the length of side  $DE$ .



**Step 1** Identify the corresponding parts.

Imagine folding the page so the triangles match. Vertices that match are corresponding angles. Sides that match are corresponding sides.

$\angle A$  corresponds to  $\angle$  \_\_\_\_\_.

$\angle B$  corresponds to  $\angle$  \_\_\_\_\_.

$\angle C$  corresponds to  $\angle$  \_\_\_\_\_.

Side  $AB$  corresponds to side \_\_\_\_\_.

Side  $BC$  corresponds to side \_\_\_\_\_.

Side  $AC$  corresponds to side \_\_\_\_\_.

**Step 2** Find the measure of  $\angle D$  and the length of side  $DE$ .

$\angle D$  corresponds to  $\angle A$ , so the measure of  $\angle D =$  \_\_\_\_\_

Side  $AB$  corresponds to side  $DE$ , so the length of side  $DE =$  \_\_\_\_\_

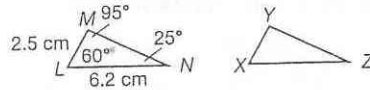
So, the measure of  $\angle D =$  \_\_\_\_\_ and the length of side  $DE =$  \_\_\_\_\_.

**REMEMBER** In congruent triangles, corresponding parts have equal measures.

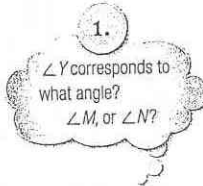
## Try It!



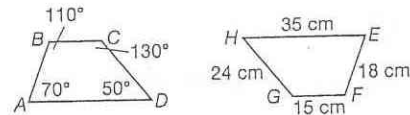
Use congruent triangles  $LMN$  and  $XYZ$  for questions 1–4.



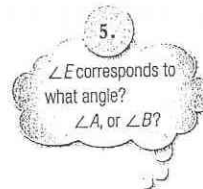
1. What is the measure of  $\angle Y$ ? 95
2. What is the measure of  $\angle X$ ? 60
3. What is the length of side  $XY$ ? 2.5
4. What is the length of side  $XZ$ ? 6.2



Use congruent trapezoids  $ABCD$  and  $EFGH$  for questions 5–12.



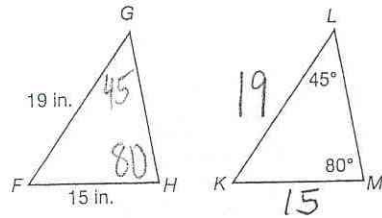
5. What is the measure of  $\angle E$ ? 70
6. What is the measure of  $\angle F$ ? 110
7. What is the measure of  $\angle G$ ? 130
8. What is the measure of  $\angle H$ ? 50
9. What is the length of side  $AB$ ? 18
10. What is the length of side  $BC$ ? 15
11. What is the length of side  $CD$ ? 24
12. What is the length of side  $AD$ ? 35



**On Your Own!**

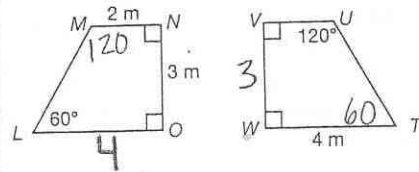
Circle the best answer for each question.

Use congruent triangles  $FGH$  and  $KLM$  for questions 1–3.



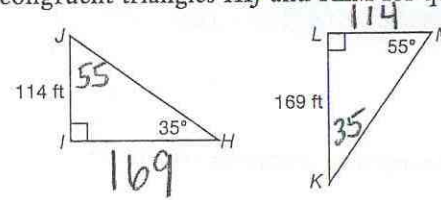
- What is the measure of  $\angle G$ ?
  - A.  $45^\circ$
  - B.  $55^\circ$
  - C.  $80^\circ$
  - D.  $125^\circ$
- What is the length of side  $KL$ ?
  - A. 4 in.
  - B. 15 in.
  - C. 19 in.
  - D. 34 in.
- Which side corresponds to side  $KM$ ?
  - A.  $LM$
  - B.  $FH$
  - C.  $FG$
  - D.  $GH$

Use congruent trapezoids  $LMNO$  and  $TUVW$  for questions 4–6.



- Which angle corresponds to  $\angle N$ ?
  - A.  $\angle W$
  - B.  $\angle U$
  - C.  $\angle T$
  - D.  $\angle V$
- What is the length of side  $LO$ ?
  - A. 5 m
  - B. 4 m
  - C. 3 m
  - D. 2 m
- What is the measure of  $\angle M$ ?
  - A.  $180^\circ$
  - B.  $120^\circ$
  - C.  $60^\circ$
  - D.  $30^\circ$

Use congruent triangles  $HIJ$  and  $KLM$  for questions 7 and 8.



7. Name the corresponding angles. Name the corresponding sides.

$\angle H$  &  $\angle K$                        $\overline{HI}$  &  $\overline{KL}$   
 $\angle I$  &  $\angle L$                        $\overline{IJ}$       $\overline{LM}$   
 $\angle J$  &  $\angle M$                        $\overline{JH}$       $\overline{MK}$

Angles                      Sides

8. Find the measures of angles  $K$  and  $J$  and the lengths of sides  $HI$  and  $LM$ .

$\angle K = 35^\circ$                        $\overline{HI} = 169$   
 $\angle J = 55^\circ$                        $\overline{LM} = 114$



Fill in the blanks.

- Congruent polygons have the same sides and angles.
- If two angles are congruent, then they have equal measures.