

Lesson 5-9

# Reinforce Understanding

## Area of Regular Polygons

I can find the area of a regular polygon by decomposing it into triangles.

### Worked model

My hexagon has 6 equal sides. Each side is 6 feet, and each center triangle has a height of 5.2 feet.

1. First I find one triangle:  $A = \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 6 \times 5.2$ .
2. I multiply:  $6 \times 5.2 = 31.2$ , then  $\frac{1}{2} \times 31.2 = 15.6$  square feet.
3. A hexagon has 6 sides, so it has 6 equal triangles.
4. I multiply:  $6 \times 15.6 = 93.6$ . So the total area is 93.6 square feet.

### Practice

Complete each exercise. Show the reasoning that supports your answer.

**1. Each regular polygon below is cut into congruent triangles by drawing a line from the center to every corner. Sort by how many triangles it makes.**

Write the name of the correct group on each line.

Groups: More than 5 triangles 5 or fewer triangles

- \_\_\_\_\_ Regular hexagon
- \_\_\_\_\_ Regular octagon
- \_\_\_\_\_ Equilateral triangle
- \_\_\_\_\_ Square
- \_\_\_\_\_ Regular pentagon

**2. A regular hexagon is divided into 6 equal triangles from the center. Each triangle has a base of 6 ft and a height of 5.2 ft. What is the area of one triangle?**

Circle the letter of the best answer. Show how you know.

- A. 11.2 sq ft
- B. 15.6 sq ft
- C. 15.6 ft
- D. 31.2 sq ft

**3. Using the triangle from the previous question, what is the total area of the hexagonal skylight?**

Circle the letter of the best answer. Show how you know.

- A. 15.6 sq ft
- B. 62.4 sq ft
- C. 93.6 sq ft
- D. 187.2 sq ft