

# Lesson

# 32

**rhombus**  
a parallelogram with  
four sides of equal length

**trapezoid**  
a quadrilateral with at  
least one pair of parallel  
sides

## Perimeter and Area of Polygons

In the previous lesson, you learned about how to find the perimeter and area of triangles, squares, rectangles, and parallelograms. You will now apply these formulas to two new figures: a **rhombus** and a **trapezoid**.

### Rhombus

The area of a rhombus is half the product of the two diagonals ( $A = \frac{1}{2}d_1d_2$ ), or it can be found by using the area formula for a parallelogram.

**Example 1** Calculate the perimeter and area of the rhombus.

*Perimeter:*

Remember, all sides are the same length.

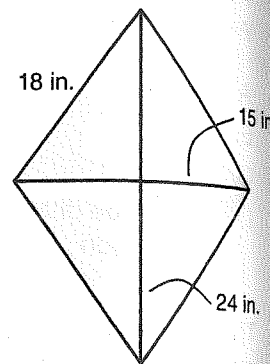
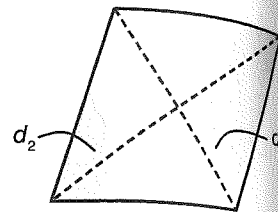
$$P = 18 \text{ in.} + 18 \text{ in.} + 18 \text{ in.} + 18 \text{ in.} = 72 \text{ in.}$$

The perimeter of the rhombus is **72 in.**

*Area:*

$$A = \frac{1}{2}d_1d_2 = \frac{1}{2} \times 15 \text{ in.} \times 24 \text{ in.} = 180 \text{ in}^2$$

The area of the rhombus is **180 in<sup>2</sup>**.



### Trapezoid

The area of a trapezoid is determined by multiplying half the height (distance between bases) by the sum of the lengths of the bases (parallel sides).  $A = \frac{1}{2}h(b_1 + b_2)$

**Example 2** Calculate the perimeter and area of the trapezoid.

*Perimeter:*

$$P = 17 \text{ ft} + 20 \text{ ft} + 42 \text{ ft} + 15 \text{ ft} \\ = 94 \text{ ft}$$

The perimeter of the trapezoid is **94 ft**.

*Area:*

$$A = \frac{1}{2} \times (12 \text{ ft})(17 \text{ ft} + 42 \text{ ft}) \\ = \frac{1}{2} \times (12 \text{ ft})(59 \text{ ft}) \\ = (6 \text{ ft})(59 \text{ ft}) = 354 \text{ ft}^2$$

The area of the trapezoid is **354 ft<sup>2</sup>**.

