

rhombus

a parallelogram with four sides of equal length

trapezoid

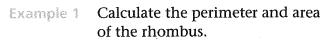
a quadrilateral with at least one pair of parallel sides

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 n_{ew} 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.





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.**

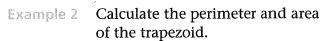
Area:

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

The area of the rhombus is 180 in^2 .

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). $A = \frac{1}{2}h(b_1 + b_2)$





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

= 94 ft

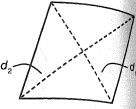
The perimeter of the trapezoid is **94 ft.**

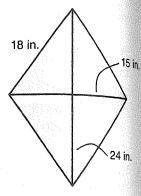
Area:

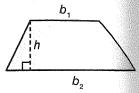
$$A = \frac{1}{2} \times (12 \text{ ft})(17 \text{ ft} + 42 \text{ ft})$$

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

The area of the trapezoid is 354 ft^2 .







20 ft

17 ft

42 ft

12 ft

15 ft

ED® Practice

wections: Choose or write the answer to each question.

A parallelogram has a base 12 millimeters long and another base 7 millimeters long. What is the perimeter of the parallelogram?

A. 19 mm

nd

o new

C. 42 mm

B. 38 mm

D. 84 mm

Find the area of the given trapezoid.

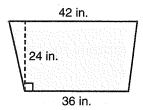
- 102 in²
- 936 in²
- C. 1,872 in²
- D. 3,744 in²

15 in.

24 in.

20 ft

ata Analysis



Arhombus has a side of 26 feet in length. What is the perimeter?

- A. 104 ft
- B. 338 ft
- C. 676 ft
- D. Cannot be determined

A parallelogram has an area of 168 cm². If its height is 8 cm, what is the measure of its base?

A. 21 cm

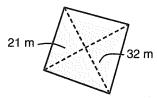
C. 160 cm

B. 42 cm

D. 176 cm

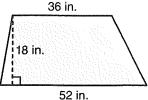
What is the area of the given rhombus?

- 26.5 m²
- 53 m²
- C. 336 m²
- D. 672 m²



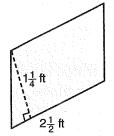
6. The following trapezoid has a perimeter of 135 inches. What is the sum of the lengths of its missing sides?

- A. 15 in.
- B. 27 in.
- C. 29 in.
- D. 47 in.

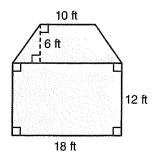


7. Find the area of the given parallelogram.

- A. $1\frac{9}{16}$ ft²
- B. $3\frac{1}{8}$ ft²
- C. $3\frac{3}{4}$ ft²
- D. $7\frac{1}{2}$ ft²



Use the figure to answer questions 8 and 9.



8. The two polygons that can be used to find the area of the figure are a rectangle and a

parallelogram trapezoid triangle

9. What is the area of the figure?

