$$A = bh$$

Chapter 9 Lesson 1: Area of Parallelograms

A **polygon** is a closed figure formed by 3 or more straight lines. A **parallelogram** is a quadrilateral with opposite sides parallel and opposite sides the same length. A **rhombus** is a parallelogram with four equal sides. Fill in the lines in the diagram with polygon, parallelogram, or rhombus and draw an example of each.

polygon

parallelogram

rhombus
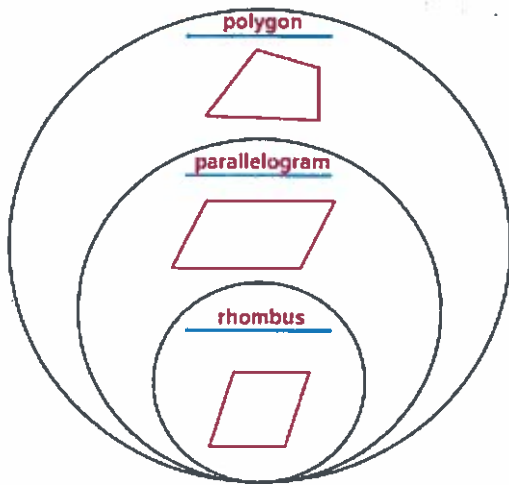
> ## Area of a Parallelogram

**Words**   The area A of a parallelogram is the product of its base b and its height h.

Model

b

h

Symbols $A = bh$

The area of a parallelogram is related to the area of a rectangle as you discovered in the previous Inquiry Lab.

The **base** of a parallelogram can be any one of its sides.

height

The **height** is the perpendicular distance from the base to the opposite side.

base

Parallelograms include special quadrilaterals, such as rectangles, squares, and rhombi.

Examples: Find the area

17 m   16 m   4 m
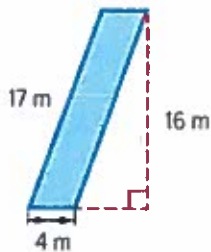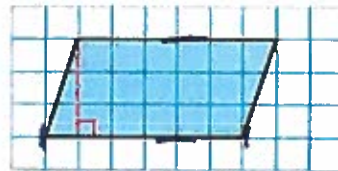
$A = bh$
$A = 4 \cdot 16$
$A = 64$

$\underline{64 m^2}$

$A = bh$
$A = 6 \cdot 3$
$A = 18$

$\underline{18 units^2}$

Use the formula A=bh to find the missing dimensions.

6 m $A = 48 m^2$

$A = bh$
$\dfrac{48}{6} = \dfrac{b \cdot 6}{6}$
$8 = b$

$\boxed{8m = b}$
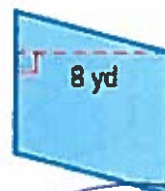
8 yd $A = 96 yd^2$
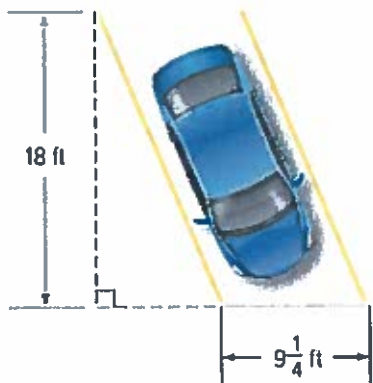
$A = bh$
$\dfrac{96}{8} = \dfrac{b \cdot 8}{8}$
$12 = b$

$\boxed{12yd = b}$

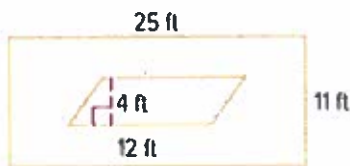Find the area of the sparking space shown in the picture.

18 ft

9¼ ft

$A = bh$
$A = 18 \cdot 9\frac{1}{4}$
$\boxed{A = 1666\frac{1}{2} \, ft^2}$

$\frac{18}{1} \times \frac{37}{4} = \frac{666}{4}$

$2\overline{)6666} \quad 4$
$\overline{333} \quad 2$
166.5
$2\overline{)333.0}$
$\underline{-2}$
$13\downarrow$
$\underline{-12}\downarrow$
$13 \downarrow$
$\underline{-12}$
10

Find the area of the shaded region in each figure.

25 ft

4 ft

12 ft

11 ft

$\overset{6}{2\cancel{7}5}$
$\underline{-48}$
227

Shaded — white

$A = bh$ $A = bh$
$A = 25 \cdot 11$ $A = 12 \cdot 4$
$A = 275$ $A = 48$

$\boxed{227 \, ft^2}$

6 cm

6 cm

8 cm

15 cm

$\overset{011}{\cancel{X}2\cancel{0}}$
$\underline{-36}$
84

Shaded — white

$A = bh$ $A = bh$
$A = 15 \cdot 8$ $A = 6 \cdot 6$
$A = 120$ $A = 36$

$\boxed{84 \, cm^2}$