

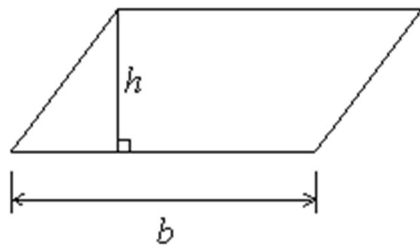
Area of a Parallelogram Notes

The **area** of a plane figure is the measure of the region enclosed by the figure. You measure the area of a figure by counting the number of square units (units^2) that you can arrange to fill the figure completely.

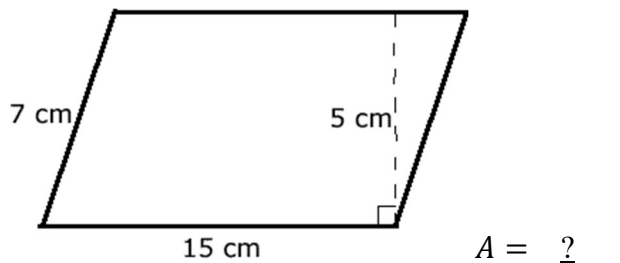


***Remember that units on area should always have a power of 2 because area is 2-dimensional (i.e. cm^2 , in^2 , ft^2 , mi^2 , unit^2 , etc.)

Parallelogram Area Conjecture - The area of a parallelogram is given by the formula $A = bh$, where A is the area, b is the length of the base, and h is the height of the parallelogram. The base and height must be perpendicular.



Example 1: Finding area of a parallelogram given base and height



***The base and height of a parallelogram must be perpendicular (meet at a right angle), so the 7 cm is a side length and extra information that we don't need.

$$A = bh$$

$$b = 15, h = 5$$

$$A = (15)(5)$$

$$A = 75$$

The area is **75 cm^2** .

Example 2: Finding base of a parallelogram given area and height



$$\text{Area} = 21 \text{ km}^2 \quad b = \underline{\quad? \quad}$$

***Remember that the side length of 3.5 km doesn't help us find the base. We are looking for the two sides that meet at a right angle.

$$A = bh$$

$$A = 21, h = 3$$

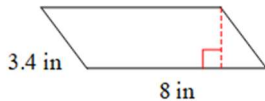
$$21 = (b)(3)$$

$$\frac{21}{3} = \frac{(b)(3)}{3}$$

$$7 = b$$

The base is **7 km**.

Example 3: Finding height of a parallelogram given area and base



$$\text{Area} = 21.6 \text{ in}^2 \quad h = \underline{\quad? \quad}$$

$$A = bh$$

$$A = 21.6, b = 8$$

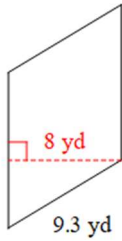
$$21.6 = (8)(h)$$

$$\frac{21.6}{8} = \frac{(8)(h)}{8}$$

$$2.7 = h$$

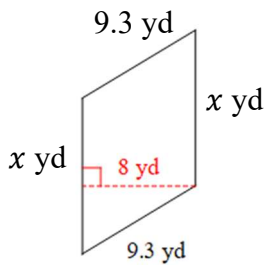
The height is **2.7 in**.

Example 4: Finding area of a parallelogram given perimeter and height



$$P = 40.6 \text{ yd} \quad A = \underline{\quad ? \quad}$$

We know that perimeter is the length of all the sides added together. We also know that opposite sides of a parallelogram are congruent.

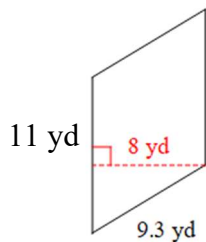


$$9.3 + 9.3 + x + x = 40.6$$

$$18.6 + 2x = 40.6$$

$$2x = 22$$

$$x = 11$$



$$A = bh$$

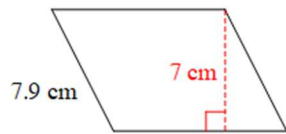
$$b = 11, h = 8$$

$$A = (11)(8)$$

$$A = 88$$

The area is **88 yd²**.

Example 5: Finding perimeter of a parallelogram given area and height



$$\text{Area} = 70 \text{ cm}^2$$

$$P = \underline{\quad ? \quad}$$

To find perimeter, we will need to know the base of the parallelogram.

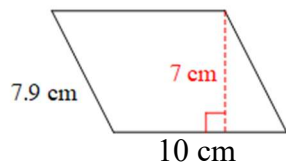
$$A = bh$$

$$A = 70, h = 7$$

$$70 = (b)(7)$$

$$\frac{70}{7} = \frac{(b)(7)}{7}$$

$$10 = b$$



$$P = 10 + 10 + 7.9 + 7.9$$

$$P = 35.8$$

The perimeter is **35.8 cm**. (Perimeter is a 1-dimensional length, so units are just cm)