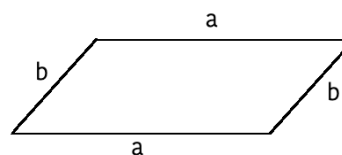
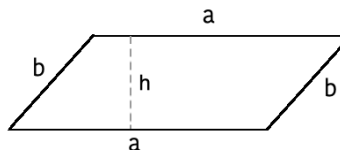


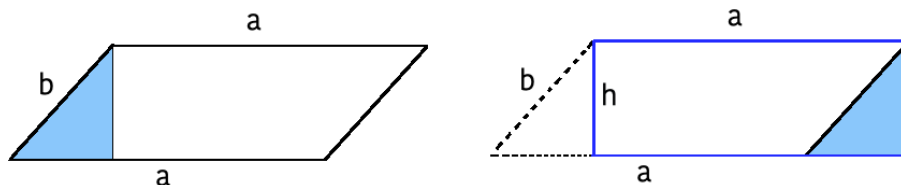
Definition: A parallelogram is a four sided polygon with two pairs of parallel sides.



Theorem: The area of a parallelogram with sides a , b and height h belonging to a is $A = ah$.

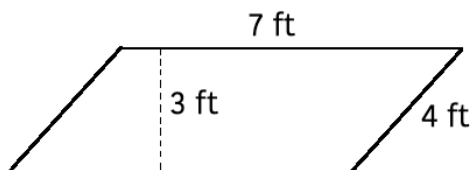


Proof: We will use a previously proven result, the method of computing the area of a rectangle. If we cut off a triangle and paste it back as shown on the picture below, we obtain a rectangle with sides a and h . Notice that b does not have any role in this formula.



Thus the area of the parallelogram equals to the area of a rectangle with sides a and h .

Example 1. Find the area of the parallelogram shown on the picture.



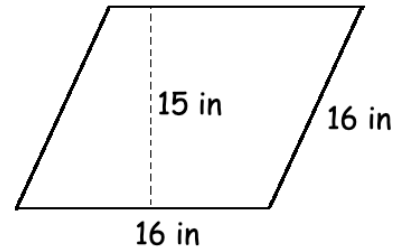
Solution: We apply the formula for the area of a parallelogram.

$$A = ah = 7 \text{ cm} (3 \text{ cm}) = 21 \text{ cm}^2$$

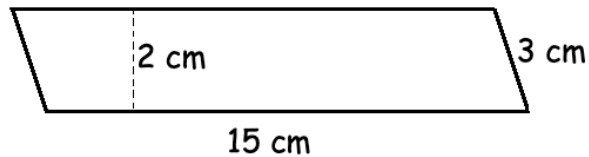


Practice Problems

1. Find the perimeter and area of the parallelogram shown on the picture. A special case of a parallelogram is when all four sides are equally long. Such a parallelogram is called a **rhombus**.



2. Find the perimeter and area of the parallelogram shown on the picture.



3. Is a rectangle a parallelogram? Explain your answer.



Answers

1. $P = 64 \text{ in}$ and $A = 240 \text{ in}^2$
2. $P = 36 \text{ cm}$ and $A = 30 \text{ cm}^2$
3. Yes, a rectangle does have two pair of parallel sides. A rectangle is a special case of a parallelogram, where the angles are right angles.