Part 2 Geometry and Data Analysis

Lesson 31

Perimeter and Area of Triangles and Quadrilaterals

Perimeter and Area of Quadrilaterals

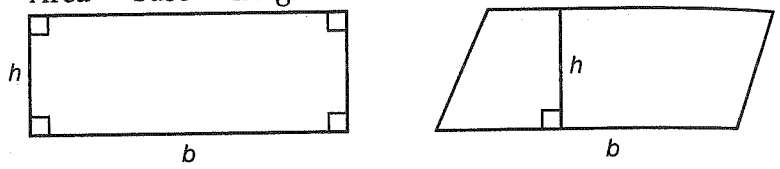
The **perimeter** of a geometric figure made up of line segments is found by adding the lengths of all the sides of the figure.

perimeter
the distance around a two-dimensional figure

The **area** of a rectangle, square, or parallelogram is the product of the base and the height. The base can be the length of any side of the figure. The height is the length of a line segment perpendicular to the base. Area is measured in square units (such as in^2, ft^2, or cm^2).

area
the measure of the surface inside a two-dimensional figure

Area = base × height or $A = bh$



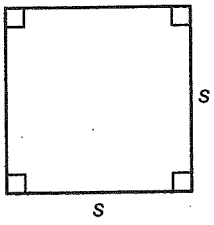
Example 1 Find the perimeter and area of a rectangle that measures 4 inches by 7 inches.

The perimeter is the sum of the lengths of the four sides of the rectangle. In this case, we have P = 4 in. + 7 in. + 4 in. + 7 in. = **22 in.**

The area is base × height. So, A = (4 in.)(7 in.) = **28 in^2.**

Tip

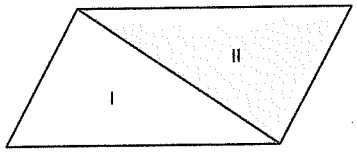
For a square with sides of length s, the area is $A = s^2$.

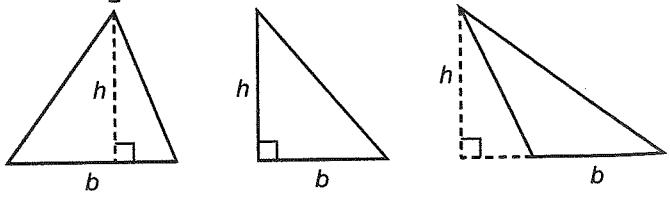


Perimeter and Area of Triangles

A diagonal of a parallelogram will divide it into two congruent triangles, each of which has an area half that of the parallelogram.

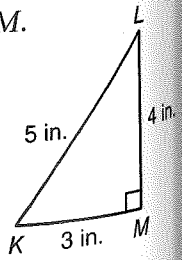
Area = $\frac{1}{2}$ × base × height or $A = \frac{1}{2}bh$





Area Δ I = Area Δ II
Area of Parallelogram = Area Δ I + Area Δ II

Example 2 Find the perimeter and area of triangle KLM.



The perimeter is the sum of the lengths of the sides, so P = 3 in. + 4 in. + 5 in. = **12 in.**

The area is one-half the product of the base and the height, so $A = \frac{1}{2}bh = \frac{1}{2}$(3 in.)(4 in.) = **6 in^2.**

GED® Practice

Directions: Choose or write the answer to each question.

1. A rectangular room is 4.5 meters by 12 meters. What is the area of the room in square meters?

   A. 27 m^2
   B. 33 m^2
   C. 48 m^2
   D. 54 m^2

2. The area of a square is 36 square inches. What is the length of a side of the square?

   A. 6 in.
   B. 9 in.
   C. 18 in.
   D. Cannot be determined from the given information

3. The city wants to preserve a rectangular mural that is 32 feet by 15 feet. One quart of protective coating covers 100 square feet. How many quarts should the city buy to cover the mural?

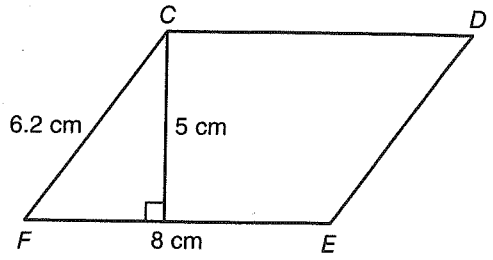
   A. 4
   B. 5
   C. 6
   D. 7

4. The base and height of a rectangle are both doubled. What happens to the area of the rectangle?

   A. It remains the same.
   B. It is multiplied by 2.
   C. It is multiplied by 4.
   D. This cannot be determined from the given information.

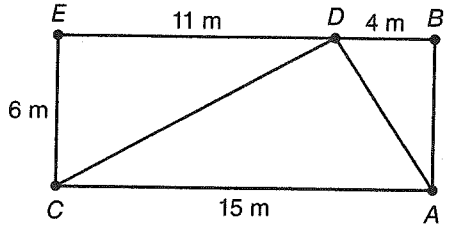
5. A contractor is tiling a kitchen floor that measures 12 feet by 18 feet. If each tile measures 2 feet by 3 feet, how many tiles are needed to cover the floor? ☐

6. Find the area of parallelogram *CDEF*.



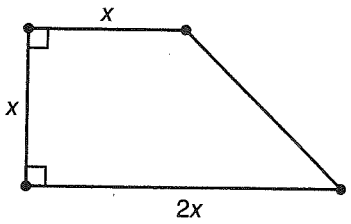
   A. 28.4 cm^2
   B. 31 cm^2
   C. 40 cm^2
   D. 49.6 cm^2

7. If figure *ABEC* is a rectangle, find the area of triangle *ACD*.



   A. 27 m^2
   B. 45 m^2
   C. 66 m^2
   D. 90 m^2

8. Complete the equation that expresses the area of the figure below in terms of *x*.



   The area is $A =$ ☐ x^2.

Answers start on page 793.